Safety Maintenance

AMERICA'S PIONEER INDUSTRIAL SAFETY MAGAZINE • NOVEMBER, 1960 • 50¢

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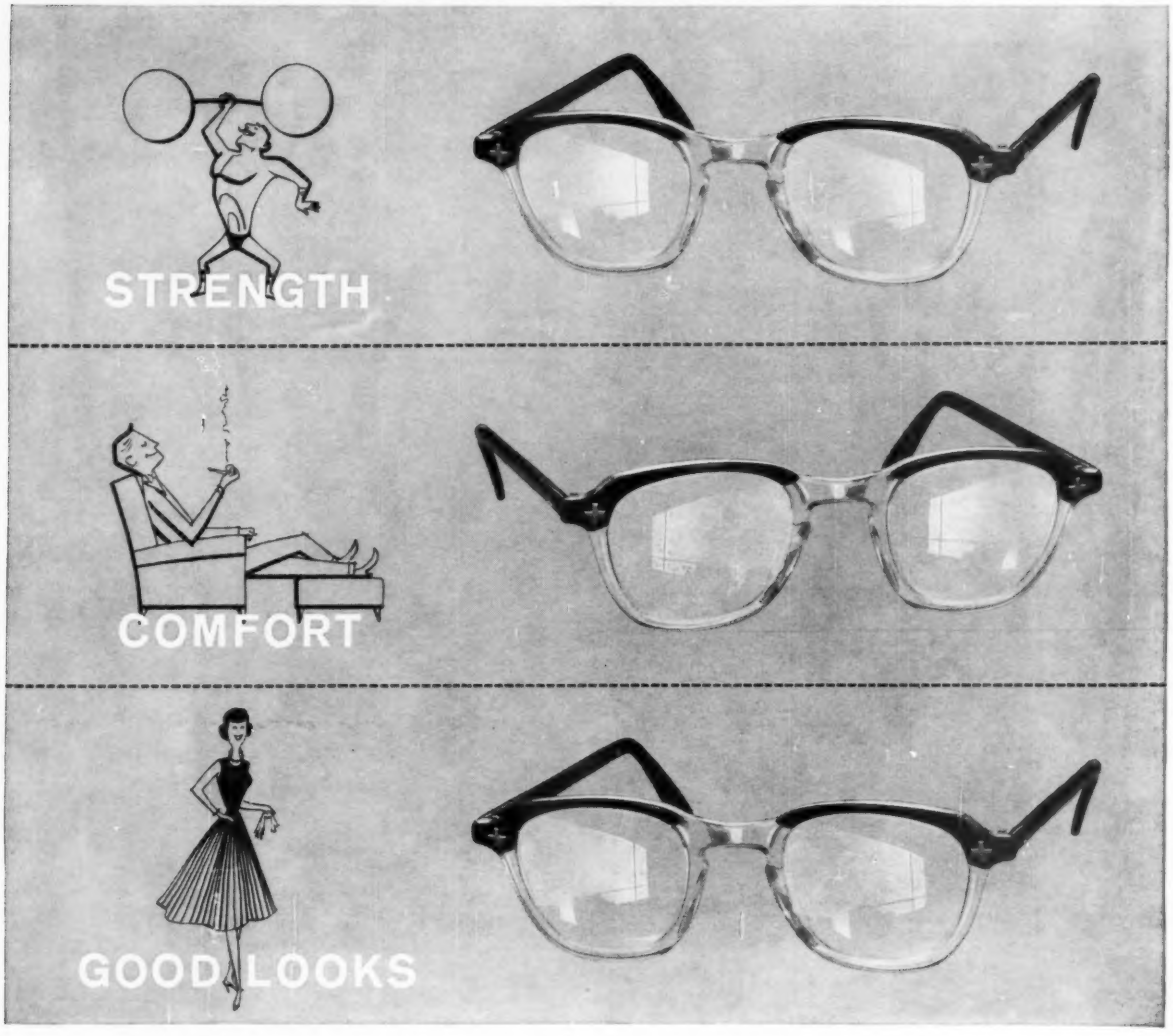

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protection + economy + worker acceptance

(For details, use Key # Y-1 on card on page 1)

LOSS STOPPERS

The bulletins and catalogs reviewed below are offered by the Reader Service Department of *SAFETY MAINTENANCE*. To obtain copies without cost or obligation, write in the key numbers on the Reader's Inquiry Card.

ELECTRICAL EQUIPMENT

Motor Starter Relay Tester 417
Multi-Amp Electronic Corp. Two-page bulletin describes test units for checking the tripping characteristics of motor starters and small magnetic and thermal circuit breakers. Units also perform other tests on circuit breakers. Other current-actuated devices may also be tested. Description, significant features, and method of testing are explained.

Corrosive-resistant Conduiets ... 418
Crouse-Hinds Co. 20-page booklet includes several pages of tables in which corrosive substances from A to Z are listed together with the appropriate corrosion-resistant metals and finishes used in the conduiets. Spec tables on conduiets and related equipment are also included. Booklet touches briefly on maintenance, application of materials and the materials themselves.

Heavy Duty Equipment 419
Continental Electric Equipment Co. 300-page catalog describes heavy duty electrical transmission and distribution equipment for commercial, industrial, residential and governmental installations. A special Electrical Control Data section is included to assist contractors, architects and engineers.

PERSONAL PROTECTIVE EQUIPMENT

Winter Liners 420
Fibre-Metal Products Co. Two-page illustrated bulletin describes a variety of liners designed to be worn under protective headgear to provide warmth in inclement weather. Form-fitting materials are washable and shrink resistant. Models to be worn with electrical type safety hats have tie type chin straps which eliminate all metal parts.

Glove Care 421
Charleston Rubber Co. 18" x 22" two-color poster, for posting on bulletin boards and in areas where gloves are stored, aids in the care and protection of linemen's gloves and sleeves. Covers such topics as how to inspect gloves for holes or damage, practices to avoid, and practices to follow. Illustrated.

Work Glove Guide 422
Riegel Textile Corp. Multi-page catalog covers basic glove patterns, cuff styles, fabrics and operations for which they are suited, etc. The illustrated booklet is divided into two parts, the second of which is devoted to several "case histories" of firms using these gloves.

FIRE PROTECTION

Fire Hose 423
Fyr-Fyter Co. Several different fire hoses are discussed in this illustrated four-page brochure. The information, including a specifications chart for each type, is concisely presented to facilitate correct hose selection, as well as to underline primary features of each. Two hose couplings are also surveyed.

Safety for Steel-Framed Buildings 424
American Institute of Steel Construction. This 44-page booklet presents for easy reference the significant features of fire-protective materials and fire-resistant systems that make steel-framed buildings economically competitive as well as structurally fire-safe. Includes a section on modern building codes and a reference table showing more than 150 constructions and their ratings.

MAINTENANCE

Brick Floor Repair 425
Master Builders Co. The repair of joints in worn or corroded brick and tile floors is reduced to seven easy steps in this succinct two-color bulletin. Each step is fully explained and illustrated, demonstrating how to produce tight joints.

Simplified Maintenance Data 426
Stonhard Co. Industrial maintenance jobs such as floor repairs, roof renovations, joint sealing and basement waterproofing are explained in step-by-step detail. Language is simplified so that inexperienced personnel can obtain professional results in performing tasks formerly done only by skilled mechanics.

Concrete Floor Treatment 427
Maintenance, Inc. Liquid treatment to prevent "dusting" is described in this bulletin. The product penetrates deeply into the surface and binds small particles together, retarding breakdown under traffic. It is also said to fill surface capillaries with tough, resilient plastic rubber and act as a deterrent to subsequent accumulation of dirt and dust.

Aluminum Roof Coating 428
Philip Carey Mfg. Co. New six-page folder describes features of coating for application on roofs of farm buildings and factories, etc. Includes information on how product prolongs roof life, reflects actinic rays of the sun, seals out moisture, reduces maintenance costs, etc. Instructions and coverage capacity are listed.

(Continued on next page)

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Free Bulletins (Cont'd)

INDUSTRIAL HYGIENE

Radioactivity Detection 429
Nuclear Measurements Corp. Bulletin outlines a fluid monitoring system that detects radioactivity in gas or water at maximum acceptable concentration levels. System employs two Gm counters or NaI scintillation counters as detectors. This allows easy comparison and permits continued operation if one unit should fail.

Toxic Dust Sampler 430
Gelman Instrument Co. Bulletin describes new air sampler used to determine toxic dusts in air and establish cleanliness levels in dust free rooms. Unit draws air through a collecting filter at rates up to 125 CFM. Bulletin also touches upon the merits of various filter papers.

Germicidal Cleaner 431
Conco Chemical Co. Four-page brochure outlines several products designed to promote sanitation and public health. Included are bactericidal cleaners and detergents, for use on floors, walls, woodwork, etc.; disinfectants for use in sick rooms, around toilets and garbage containers, showers and locker rooms, etc.; and germ-killing hand soaps.

Dust Control Equipment 432
American Air Filter Co. Well-illustrated 11-page booklet surveys complete line of dust control units; discusses the four main types: dry centrifugals, wet collectors, fabric collectors and electrostatic precipitators. Capacities and specific applications of the various models are explored.

MISCELLANEOUS

Infrared Gas Analyzer 433
Mine Safety Appliances Co. Four-page folder details features of the new analyzer, including size, portability, flexibility. Outlines applications for furnace atmosphere and combustion control, humidity measurement, petro-chemical process stream analysis, gas detection, etc. Schematic diagram and performance specifications included.

What's Your Problem?

- **Has an accident or fire interrupted production?**
- **Want to know how to prevent it?**
- **Do you need background information on equipment for industrial safety, hygiene, or maintenance?**

As a service to its readers, "Safety Maintenance" will arrange to supply manufacturers literature on the following subjects. Just insert the key number on the Readers Inquiry Card on the preceding page and be sure to fill in your name and address. If you need information on a specific type of product, simply write it in on the Inquiry Card.

Number Key	Subject
	PERSONAL PROTECTION
101	Safety Goggles
102	Face Shields
103	Lens Cleaning & Anti-Fogging Equipment
104	Sweat Band
105	Hard Hats
106	Respirators & Masks
107	Protective Clothing
109	Safety Belts
110	Safety Gloves
112	Anti-Slip Soles
113	Oil-Resistant Soles
114	Welding Helmets
	FIRST AID AND HYGIENE
122	Sanitary Drinking Facilities
124	Salt Tablets
125	Resuscitator Tubes
126	Antiseptic Medication
127	Burn Medication
128	First Aid Kits & Supplies
129	Stretchers & Litters
129A	Stretcher Cases
130	Throat Medication
131	Eye Wash Fountains
131A	Emergency Showers
132	Portable Ventilators
133	Dust Collectors
135	Hearing Protectors
136	Noise Analysis Equipment
137	Noise Mufflers
138	Athlete's Foot Preventive
	FIRE PROTECTION
139	Fire Retardant Paint
140	Fire Extinguishers
141	Safety Cans
142	Fire Alarms
143	Safer Solvents
144	Degreasing Machines
145	Drum Safety Valve
146	Asbestos Textiles

Key Number	Subject
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149	Fire Blankets
	LIGHTING AND WARNING DEVICES
150	Alarms & Warning Lights
153	Fluorescent Lamp Guards
154	Emergency Lights
	MAINTENANCE
161	Anti-Slip Waxes & Finishes
162	Floor Cleaning Compounds
164	Floor Resurfacing Compounds
163	Floor Cleaning Machines
166	Floor Mats
167	Insulating Tape
168	Ultrasonic Flaw-Detector
169	Machine Motion Analyzer
	LADDERS & HANDLING
170	Ladders
171	Ladder Safety Devices
172	Scaffolds
173	Work Platforms
174	Emergency Ladder Rungs
176	Fork Truck Steering Aid
177	Carboy Pumps
	GUARDS
178	Machine Guards
179	Power Press Feeders
180	Safety Tools
181	Vacuum Sheet Lifters
182	Valve Operators
184	Safety Lock-Outs
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192	Safety Awards & Emblems
193	Employee Safety Guide
195	Changeable Letter Signs
196	Safety Poster Kit

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Safety Maintenance

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Volume 120, Number 5 **November, 1960**

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Cover picture from Cessna Aircraft Company's Military Division: Nurse in Wichita plant applies medication to minor abrasion of a production line worker. Company plants have completely equipped first aid facilities.

AMERICA'S PIONEER INDUSTRIAL SAFETY MAGAZINE

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it's SAFE to say

● THE FIRST TWO MILLION

After nearly sixty years' experience in publishing the nation's first safety magazine, SAFETY MAINTENANCE does not believe in devoting much space to items commemorating long-time safety records *UNLESS* we can tell our readers how to achieve the same objective in their own plants. The operation in Jacksonville, Florida couldn't care less about the accident-free record of the Spokane, Washington plant, worthy as it may be, until we tell Florida how to put into effect the same injury-reducing procedures designed to bring about a drop in their own causes of disabling injuries.

The experience of Cessna Aircraft in reaching the milestone of two million man-hours without a lost time accident, as detailed elsewhere in this issue, can be passed on to readers everywhere even in entirely unrelated industries. First of all, top foremen in the Military Division of Cessna Aircraft were given clearly defined safety responsibilities. They were not led to believe that their sole function was production because management knew that production without safety means reduced production. According to Otto Irby, Division Works Manager, the rank and file invariably takes its cue from the supervisory staff and when the higher echelon evinces little or no interest in any phase of the job, the man at the bench soons learns to take a "what's the use?" attitude. On the contrary, when foremen can be shown the multiple dividends to be obtained by a never-ending interest in reducing the cause of disabling injury, they cease paying mere lip service to safety and begin contributing.

Within a period of two years, Cessna was able to reduce eye accidents more than 300 percent. At one time, eye injuries comprised 50 percent of all lost-time accidents. Now, however, the use of eye protectors is mandatory in all production areas and shops—even for plant visitors—and this rule alone is partially responsible for their two million safe man-hour record.

Eye protection is only a part of the Cessna achievement. Ear plugs and muffs for flight line personnel; hard hats for head protection; plastic aprons to protect drill press operators against skin troubles; coated gloves to safeguard industry's most vital tool; safety shoes and respirators to screen from the lungs the hazards of dust, fumes, filings, etc.,—all those protectors as well as mechanical guards offer conclusive proof that a plant need not be engaged in the production of aircraft to build up an impressive record of man-hours worked without the spectre of disabling injury hovering over the operation, whether it be located in Spokane, Jacksonville, Boston or Wichita.

● THE LONG HAUL

Certainly, the Supervisor of Physical Education of the University of California knows what he is talking about when he points out, in a picture feature in this issue, that the man most likely to succeed in suffering back strain is the ex-athlete who has been sitting at a desk for 10 or more years, is 15 to 50 pounds overweight and believes he is in "as good condition as I ever was."

The spinal column with its 33 vertebrae, each with 7 processes and a mass of ligaments, discs and muscles holding the structure together is such a complex mechanism that it is small wonder it ever is in good working order *especially* when it is abused times without number by faulty lifting and hauling practices.

It is not enough to tell professional and amateur weight lifters to lift heavy objects by bending the knees and placing the strain on thigh and leg muscles where it belongs rather than on the back or groin. The carefully posed photographs should be studied and used as a guide to safe lifting if the human derrick is to function over the long haul without a breakdown.

THE FUTURE SHOWS

Columbus, Ohio *November 14–16*

Annual Fall Conference of the National Fire Protection Association (Deshler Hilton Hotel). Carl J. Setzer, Ohio Inspection Bureau, Columbus, Ohio.

New York, N. Y. *December 12–15*

Industrial Building Exposition & Congress (Coliseum). Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N. Y.

Chicago, Ill. *January 23–26*

Twelfth National Plant Maintenance & Engineering Show and Conference (International Theatre). Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N. Y.

Philadelphia, Pa. *March 1–2*

Twenty-Seventh Annual Regional Safety-Fire Conference and Exhibit (Bellevue-Stratford Hotel). Harry H. Verdier, Executive Director, Safety Council, Chamber of Commerce of Greater Philadelphia, 121 S. Broad St., Philadelphia 7, Pa.

Atlanta, Ga. *March 5–7*

Twenty-Second Annual Southern Safety Conference and Exposition (Atlanta Biltmore Hotel). W. L. Groth, Executive Director, P. O. Box 8927, Richmond 25, Va.

Fort Wayne, Ind. *March 14–15*

1961 Northeastern Indiana Safety Conference and Exhibit. Ivan A. Martin, Manager, Safety Council, Chamber of Commerce Bldg., Ft. Wayne, Ind.

Los Angeles Calif. *March 28–30*

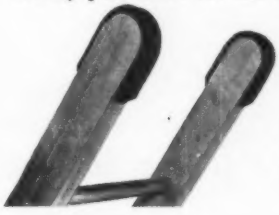
Eighth Annual Western Safety Conference & Exhibits (Ambassador Hotel), Joseph M. Kaplan, Manager, Greater Los Angeles Chapter–National Safety Council, 3388 W. 8th St., Los Angeles 5, Calif.

Safe ladders . . . Save lives!

(600)

Slipping ladders cause more accidents . . . and result in more injuries . . . than any other single hazard, according to a recent survey by the Wisconsin Industrial Commission. This disgraceful fact is all the more disturbing because there is absolutely no excuse for most of these accidents. The simple inexpensive installation of Safe-Hi ladder shoes is your guarantee against accidents . . . which of course mean man hours lost, work stoppage, compensation. Ladder shoes eliminate both need and expense of second worker holding base of ladder.

Shoe tread construction of both neoprene and fibrous material gives maximum protection against ladder slipping on any industrial surface whether wet or dry, soapy, greasy or slick. Straight ridge design crosses line of slippage and acts as a series of squeegees in scraping off foreign substances thus insuring a good grip on any surface. Added feature is a self-sharpening spike which can be readily positioned for use in ice, snow or gravel.



Safe-Hi Wall Grip (640)

The Safe-Hi wall grip holds the top of the ladder securely on all smooth walls. Prevents side slipping and helps to hold the bottom of the ladder.

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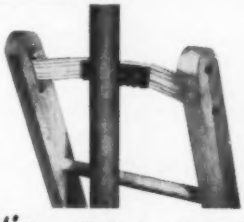
The Safe-Hi pole grip holds top of ladder on any pole, pipe or corner. Fits any ladder. Helps prevent ladder tipping.



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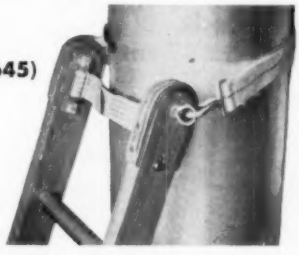

Safe-Hi Ladder Lash

The Safe-Hi ladder lash is quickly attached to any ladder. Strap made from 2800 lb. tensile strength parachute webbing with forged steel snap. Lash features quick adjustment slide that gives positive hold on pole.

Complete information on any Safe-Hi Safety equipment, write for free catalog.

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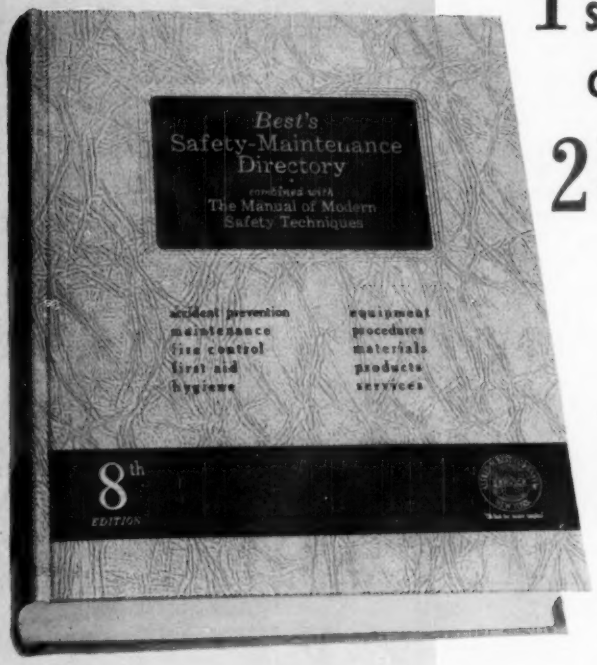

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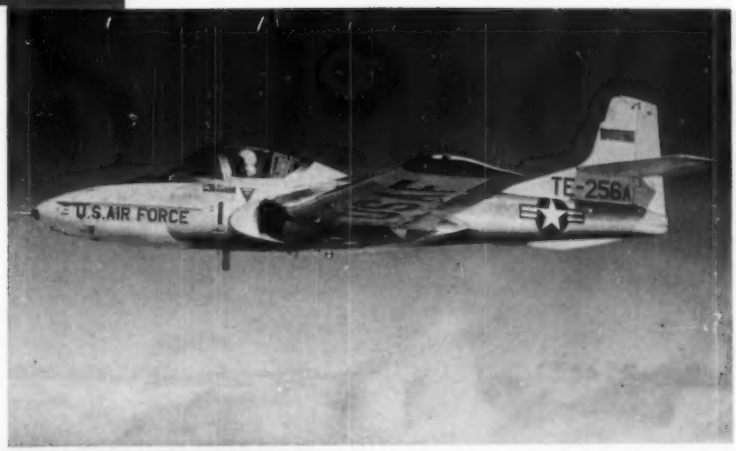
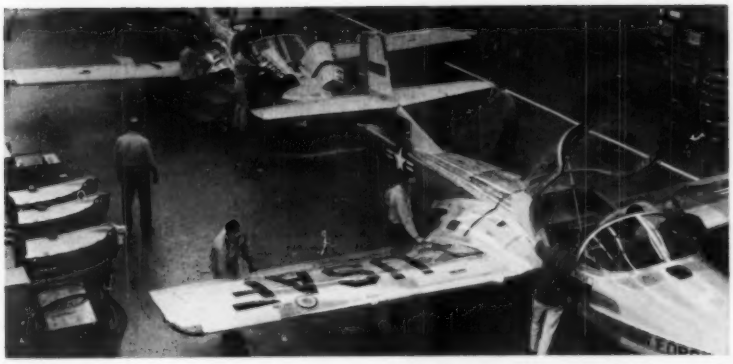
SAFETY SOARS FROM





A DOWN-TO-EARTH PROGRAM

A long sought goal of two million safe production man-hours was achieved on September 6th by employees of Cessna Aircraft Company's Military Division in Wichita, Kansas.

Employee spirits and safety consciousness have been soaring since the Division attained a record 1,000,000 accident-free production manhours in April, 1960, according to Otto Irby, Division Works Manager. "The closer we came to our two million goal, the more safety minded everyone became," he commented.

The two million hour achieve-

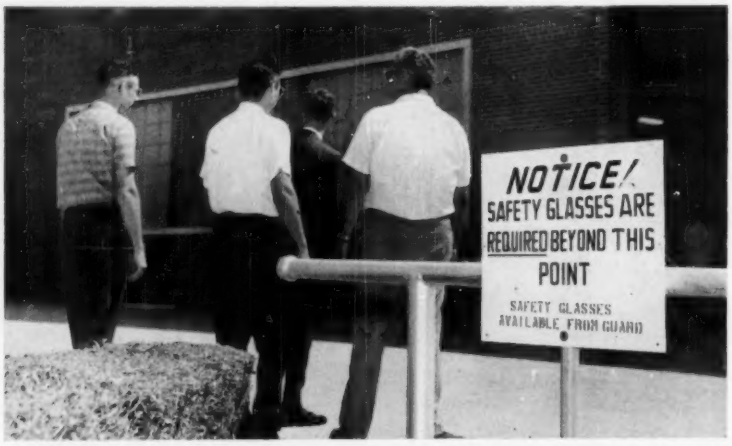
Over 1 million man-hours ago this sign was put up. Since then, the plants have passed the 2 million man-hour safety mark. Duane Stone, plant engineer, left: Otto Irby, works manager, inspect progress board reflecting safety goal.

General Safety Committee: (clockwise) D. Greene, chief administrative engr.; M. Ochsner, quality control mgr.; Duane Stone, plt. engr.; Bill Hare, foreman; Bill Gilley, factory supt.; Bill Stephens, foreman; Dale Greenlee, job analyst.

2,000,000 Safe Man-Hours

Eye Injuries Cut 300%

For the way they did it, see the next two pages.



No one enters a Cessna Military Division Plant without protection of safety glasses. Sign at right reminds employees, visitors of protection requirements.

Well fitted, properly ground glasses have been a major factor in reducing eye injuries at Cessna by more than 300 percent over past two years. Here an employee is fitted with new frames to assure comfort and safety on the job.

Smile of the Wise Owl is worn by Cessna employee whose eyesight was saved by safety glasses during mishap.

Safety-toe shoes, major accident cutting factor, are encouraged. Here an employee inspects several smart styles.

ment is a measure of safety excellence in the industry, and a record rarely attained, according to National Safety Council records. The Military Division, which comprises the Prospect and Wallace plants, has operated without a lost-time accident since mid-November 1959.

Credit for the long period of accident-free operation of the plants was given to safety conscious employees. "Cessna has maintained a safety program for many years, but recently concentrated on developing a personal awareness of safety on the part of the individual," Irby explained.

In the initial step, top supervisors and foremen were given safety responsibilities as members of the Division's General Council. "When this group saw the dividends which a sound program pays, they quit paying lip service to safety and began contributing," Irby stated. "The attitude of the people under these foremen soon proportionately reflected an awareness and desire for increased safety," he commented.

In pointing out accident reduction areas, Irby cited eye injuries, which have been reduced more than 300 percent during the past two years. At one time, eye injuries comprised about 50 percent of the lost time accidents in the Cessna division. The wearing of safety glasses in the production areas and shops is now mandatory.

Production line visitors often comment when they see all employees wearing eye protective equipment. Even visitors to production and workshop areas are required to wear safety glasses.

Indicative of increased employee safety consciousness is the fact that production facilities of one complete aircraft were transferred between plants during this period. The greater risk of injury involved in this move, coupled with the influx of several hundred new production employees, made Cessna's safety program even more vital and its success more indicative.

Currently being produced on Cessna's Military Division production lines, are T-37B intermediate twin-jet trainers, and U-3B light cargo and liaison aircraft for the Air Force. Under subcontract,

Cessna produces tail surfaces for the Republic F-105 fighter-bomber, and Boeing B-52 heavy bomber, as well as support equipment for the Boeing Minuteman intercontinental ballistic missile.

Why Mandatory Eye Protection?

An accumulation of events prompted the institution of a mandatory eye protection program. Insurance costs were rising as a direct result of eye injuries; from the humane aspect, management was concerned about these tragic injuries to employees; and reports from the industrial engineering department indicated that considerable production time was being lost because of eye injuries. All these factors focused attention on the vital need for positive measures to protect the sight of personnel.

After a lengthy study, a recommendation was made to top management to adopt a mandatory eye protection program. The plan was for a two-pronged attack on eye problems.

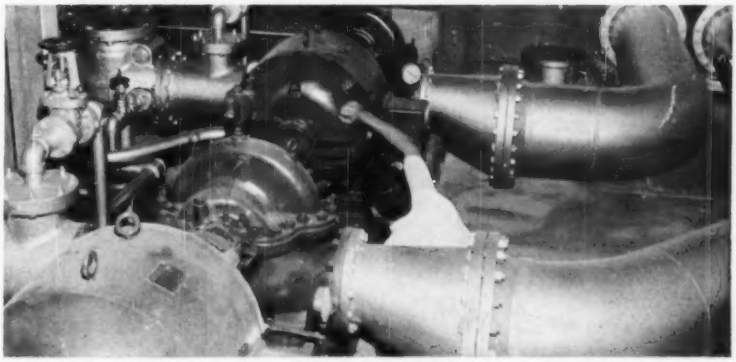
The first objective was to obtain a permanent record of each employee's sight abilities. Management knew not only that poor vision is the underlying cause for many accidents, but also that it was rendering a worthwhile service to its employees in giving free eye examinations and bringing to the individual's attention any need for vision correction. Employees were called to first aid stations by department and an eye check was made using a company-owned vision testing instrument.

The second stage of the program was the protection of eyesight. After the eye check, each employee was fitted with safety glasses and also issued a metal case in which to store the glasses when not in use. Glasses were assigned to employees on tool checks for accountability. For most of the production departments, impact glasses with and without side shields are worn; but other eye-protective equipment is provided for specialized jobs, such as face shields for chemical work and for sawing, grinding, sandings, etc., and welding goggles and helmets for welding operations.

(Continued on page 20)

Safety is everywhere at Cessna. Signs like one on cigarette machine keep individual safety consciousness high. New reminders are posted frequently.

Ear and fire protection are important elements of any safety program that involves jet aircraft. Flight test personnel, with extinguishers, run a check.



Giant water pumps which support plantwide sprinkler system get regular, full check by plant engineer. Mobile fire fighting units protect test flight aircraft.

NOT Heading For a Fall

It happens every day—on public and private sidewalks . . . in factories and on loading docks . . . in baths and shower stalls . . . on the decks of yachts and fishing boats . . . and in homes. Suddenly your feet go out from under you, there's wild grasping for support—and crash—you're flat on your back.

If only your dignity has been bruised, you've been lucky. Almost all surfaces are slippery and dangerous when wet—many are hazardous even when footing is dry.

A slip may lie in wait almost anywhere!

But recent research in walkway safety can keep your personnel from becoming "fall guys."

A new field in safety engineering has opened up as a result of the development of new epoxy and poly-urethane resins. Non-slip abrasive, formerly called sidewalk abrasive, is now broadcast into these resins to provide economical walking safety under a variety of adverse conditions.

Truckmen averaged an accident a week on this steeply inclined ramp. No accident has been reported in more than year of service given by this non-slip compound.

The resin-abrasive coating can be brushed or rolled on wood, steel, concrete, stone and practically any other walking surface. Aluminum oxide or silicon carbide abrasives are among the abrasive materials that can be used, depending on preference or type of job.

Successful applications have been tested on sidewalks, platforms, open decks, steps to private homes, swimming pool areas, ocean pilings, skiffs, building entrances, galleys of fishing trawlers, industrial plant areas, stairways, shower stalls, ramps and heavily traveled shipping areas. A test of boiler plate coated with the resin-abrasive combination showed no sign of wear after six months of constant daily traffic with heavily loaded hand trucks.

Easy Application

Non-slip protection can now be added to existing hazardous surfaces with no special equipment or training. There are four simple steps for applying the non-slip surface:

1. Remove all grease and oil and clean the area to receive the application. This will provide a good bonding surface.

2. Brush or roll on a coat of one of the new epoxy or poly-urethane resins.

3. Broadcast a uniform layer of non-slip abrasive.

4. Remove any surplus abrasive and apply a second locking-in coat of resin.

Most resins set up hard enough for foot traffic within a few hours. After 8 to 24 hours the surface will bear heavier traffic and will continue to set up for seven days, when it will reach ultimate hardness. Quicker curing can be obtained by using infra-red heating or heating lamps which will cure the resins to ultimate hardness in a few hours.

The resin-abrasive surface resists water, acids and alkalis. It protects the base material from weather and the wear of industrial

FLOOR MAINTENANCE SERIES
Other Articles Dec. & Jan.

Under this type of heavy service, wooden warehouse floors break down. New resin-abrasive protects workers from slipping.

materials. Resins are available in a variety of colors which permit the installation of safe walking surfaces to harmonize with the surroundings.*

Safety Installations

One of the first experimental applications of this non-slip resin-abrasive surfacing was aboard a boat of the Boston fishing fleet. Commercial fishermen are considered poor insurance risks because of their hazardous occupation. One of the most serious safety problems is falls at sea. Not only are the decks constantly in motion but they are often wet with salt spray, rain and slippery fish scales.

In this test, the old wooden decks of the trawler Michigan were sanded down to solid wood to remove the weathered su[illegible]

resin-abrasive compound was troweled on and finished with the same tools used for conventional cement finishing.

After the next trip to the fishing grounds, Captain Ben Larson of the Michigan and his crew gave an enthusiastic endorsement of the experiment.

Another marine test installation was made in the galley of the M/V Delaware operated by the U. S. Fish and Wild Life Service out of East Boston. The non-slip resin-abrasive combination was applied around the range. The cook aboard the Delaware, had high praise for the walking safety qualities of the new material. Carrying a kettle of hot soup across the rolling deck of a trawler calls for sure footing; and he is now looking forward to the installation of this surfacing compound on the outside passageway he has to use when getting provisions.

Slippery Ramp

Another hazardous area covered during the testing of the non-slip resin-abrasive mixture was a steeply inclined service entrance ramp at a Boston hotel. There had been an average of one accident a week among truckmen delivering supplies. In the year that the resin-abrasive surfacing has been in place, there hasn't been a single accident due to slipping.

In the same hotel, this compound was applied to the floor in front

(Continued on page 40)

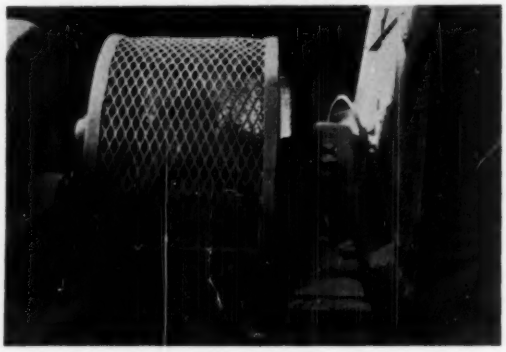
* A source for further information about abrasive-resin resurfacing materials can be obtained upon inquiry to the Editor.

Aluminum Oxide and Silicon Carbide Abrasives Can Be Used Interchangeably—But They Do Have Slightly Different Characteristics:

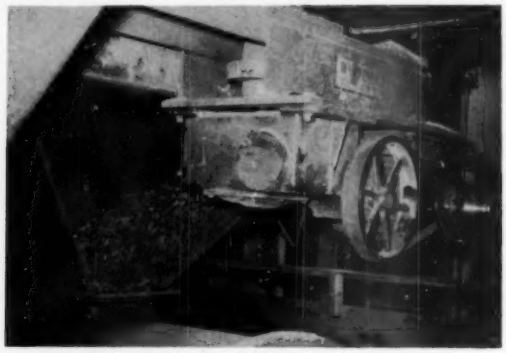
	Characteristics	*Suggested Applications*
Aluminum Oxide	The abrasive particles have a blockier shape, are less friable, slightly lower in cost, and have a dull brownish black color.	Heavy traffic areas, such as factories, warehouses, loading docks, sidewalks, stairways, ramps, ladders, etc.
Silicon Carbide	The particles are more compact and are black with a sparkling sheen.	Areas where appearance is important and traffic may be somewhat lighter, as in building entrances, corridors, public and commercial buildings, swimming pools, showers, etc.

GUARDING TECHNIQUES

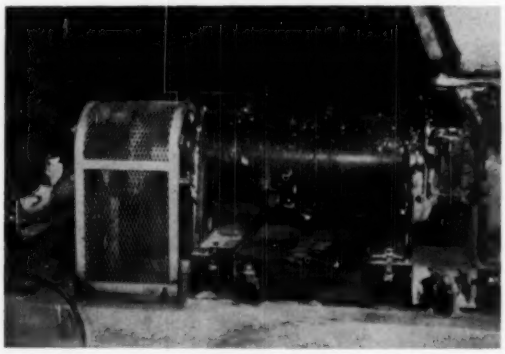
Safeguards Added to New Installations



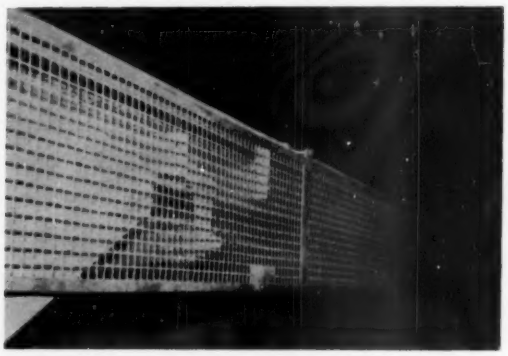
Couplings adjacent to speed reducers of dryer drives were completely unguarded when originally installed. Guards for the couplings were fabricated and installed by the plant.



This picture shows the V-belt drive on a new raw mill table feeder before the guard was installed. Sheet metal guards were installed as a covering to eliminate pinch point hazards.



Unguarded couplings between motors and pumps are unsafe. A fabricated metal guard prevents contact with the coupling.



Enclosure guards on all four sides were provided for new packing machine fan conveyor belts.

The metal safety guard we installed on the inclined belt inside the tunnel.

Guard on top of the clay feed hopper tank. Grating has 6″ openings.

THAT WORKED

by **WILLIAM A. KIPP**
Director of Safety
Universal Atlas Cement Div.
U. S. Steel Corporation
New York, N. Y.

In the Reports of the Committee on Engineering of the President's Conference on Industry Safety—1949, the following statement was made:

"The prevention of accidents which result from lack of guarding, poor design, or other machine failure is an engineering matter, the one place in the safety program where typical engineering methods can be applied to best advantage and where, as has been repeatedly proved by many concerns with well implemented safety programs, this type of accident can be reduced to the vanishing point.

"The safe design and general safeguarding of machinery, tools, and equipment is fundamental to industrial safety and this phase of safety work must be carried out with a high degree of effectiveness before an employer can reasonably ask his employees to do their share in accident prevention through adherence to safety practices."

It is realized that on new equipment, machinery and installations, pre-purchase and pre-installation planning is most important. The result is an accident-prevention service as well as an economic service. Obviously it is less expensive for the vendor to provide adequate guards at the time of manufacture than it is for the buyer to fabricate and install guards in the field.

However, in the course of human events, we do not always find perfection. There are times when the physical hazards must be corrected after the receipt or installation of equipment, machinery and buildings. To assure that all physical hazards are eliminated from new equipment, machinery and installations in Universal Atlas plants, we use safety inspections forms for all new installations that either permit immediate and unqualified use or immediate use with minor modifications by a specified date; or prohibit use until changes have been effected.

The accompanying pictures show some of the safeguards for new equipment, machinery and installations. Most, but not all, were taken in Universal Atlas plants. They do not necessarily indicate that there was insufficient planning before purchase or installation.

In addition to the guarding techniques illustrated, mention might be made of a few other safeguards for new equipment. For example, burnermen helpers have to check the cooler multiclone fan bearings

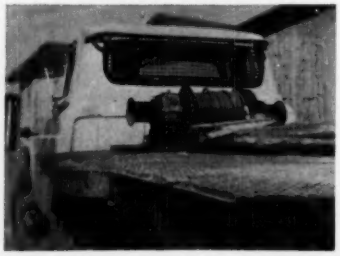
Inadequate Guards Replaced

Guards originally supplied for belt drives are sometimes not adequate. The example shown here gives protection only on the outside. We replace these covers with new guards that furnish protection both on the outside and inside.

Dust collector fan drives were guarded when installed but the guards were open at the bottom. These drives were multiple V-belt type and steps from the floor below were located adjacent to these drives. Anyone using the stairs at the time of a belt breakage could easily have been struck by the broken belt. A new expanded metal strip was installed along the bottom.

Lubricators on compressors driven by a belt were not provided with guards between the lubricator and belt drive, as shown here. When servicing the lubricator, the hands of the maintenance man were necessarily quite close to the drive. An erratic movement of the hands could quite easily have caused serious injury. A metal guard is now installed as a barrier between the lubricator and belt drive.

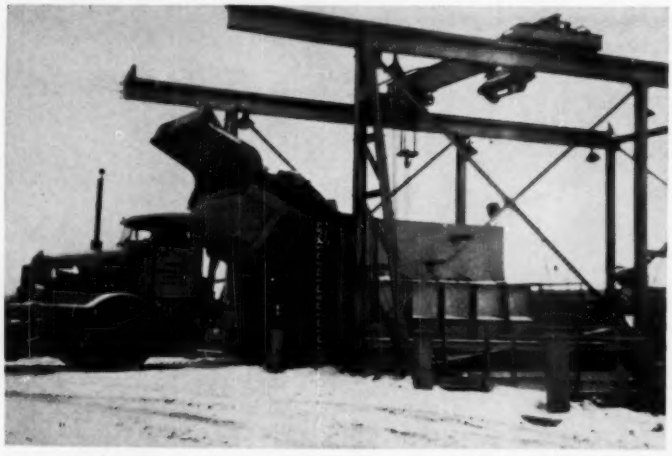
SAFEGUARDS FOR TRUCKING OPERATIONS



On a truck used for general maintenance work, a guard of 1" wire mesh was installed over the rear window to prevent glass breakage. Note also the ¾" round rod bolted to the cab directly above the window. This rod serves as a safety handrail for persons loading or unloading the truck.

Another safety addition to this truck, although not visible in the picture, is a 12" x 10½" step, welded on each side of the bed and just behind the cab, to provide a safe means of mounting to or dismounting from the truck bed.

This bunker at the crusher prevents rocks from falling off the truck and injuring anyone nearby. The stairway provides safe, easy access to the crusher without having to climb the bank.



At the hopper of an apron feeder at a primary crusher, there was a hazard of rock falling from the truck-dumping operation onto a walkway running alongside the hopper. To protect the walkway area, a vertical extension of sheet steel was added to the side of the hopper.

Two new quarry trucks that we purchased came equipped with a safety canopy over the cab. However, we felt that the low rim on the canopy would not prevent rocks from rolling over onto the windshield and hood. As shown in the picture, an 8" extension lip was added to the end of the canopy. Also shown are 12" extensions of the sides of the truck bed to prevent rocks from rolling off the truck into the path of on-coming traffic on the haulage road.

several times each shift. To do so, they had to climb a wooden ladder to the fan platform. A permanent steel ladder was installed at each of three platforms.

Large enclosure guards of expanded metal or metal mesh were erected to protect workmen around dangerous machinery areas, such as the pan conveyor in the crushing department, around the breaker plate and fly wheel on the hammer mill, for the tail pulley on the tripper belt, etc. A barrier guard was installed at the tail end of the apron feeder.

The dust scoop feeders on kilns dropped a large amount of dust to the ground floor of the kiln building. Every day the yard department sent two or three men to clean it up. The spill amounted to two or three payloader buckets of dust. The dust was not hot, but it was a housekeeping nuisance. This dust-spill problem was overcome by fabricating and installing a catch bin underneath the scoop feeder. The bin is emptied every day by a payloader operator, who has only to open a slide on a pipe at the bottom of the bin. The dust empties into the payloader bucket without spillage on the floor.

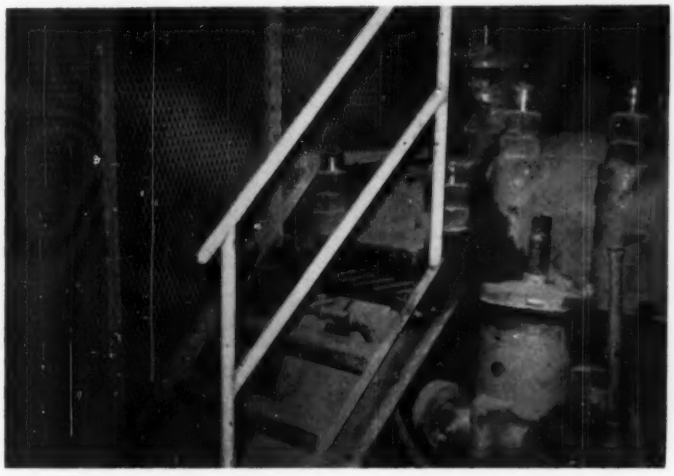
The original "in line" arrangement of air separator drives provided very little clearance between the drive and adjacent conveyors. As a safeguard to personnel, these drives were rearranged into a more compact setting that would provide adequate clearance.

At the unloading station on the railroad spur a track grating and a solid metal guard were installed to prevent personnel in this area from falling into the underground opening or coming in contact with the moving conveyor belt.

Most of our elevators were installed with no means of hoisting repair equipment to the drive or head traction level. While inside elevators were taken care of by lifting to the building purlins and beams, the outside elevators required a boom crane with an excessively long boom or a makeshift jib boom to hoist the material. To take care of this hazard, trolley beams and a trolley hoist were installed above the elevators.

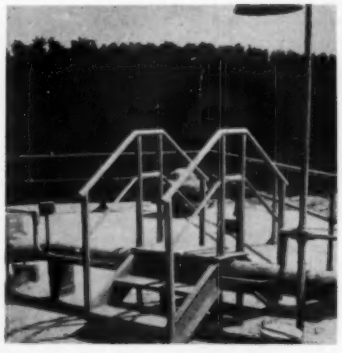
From an address presented at the 47th National Safety Congress. Pictures by courtesy of Universal Atlas Cement Div., U. S. Steel Corporation.

SAFEGUARDS FOR WALKWAYS AND WORKING AREAS

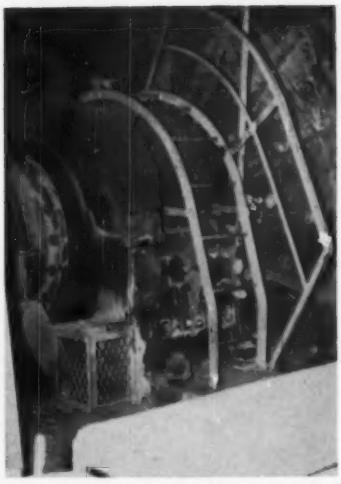


A metal guard has been erected around the fly wheel of the crusher. Also, the stair and handrail lead to crusher bearing.

Before installation of this work platform, complete with handrail and toe plates, electricians were exposed to the hazard of working in behind this control panel from a ladder. The platform eliminates safety hazards and provides for more efficient repairs.



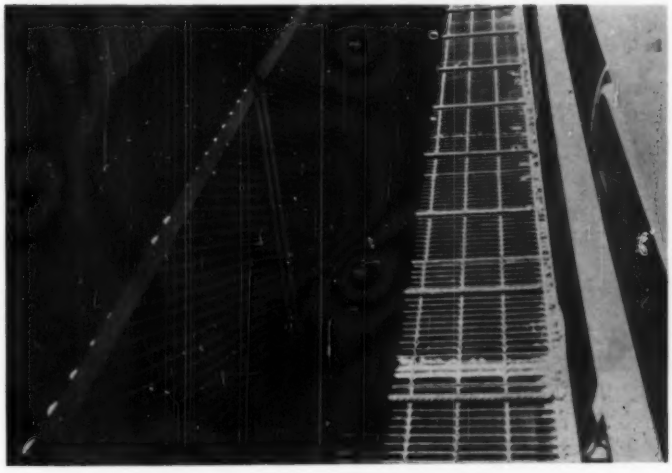
The pipe lines on the top of a silo presented a hazard, especially at night, until these crossovers with handrails and the electric lights were installed.

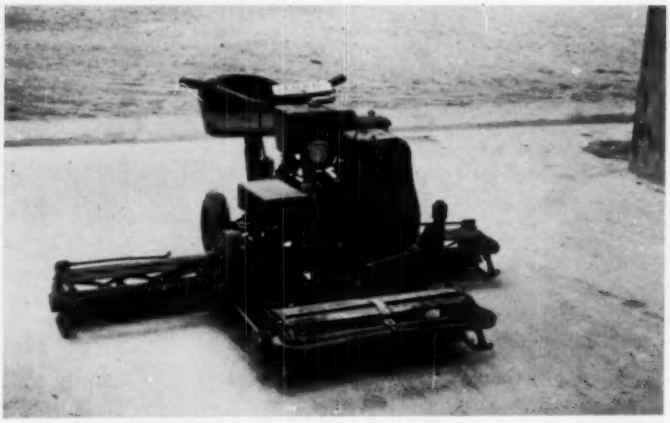


On the bearing housing of a grinding mill a curved ladder with side bars was installed to protect the operator from coming in contact with the mill discharge head, when inspecting the oil level in the journal bearings.

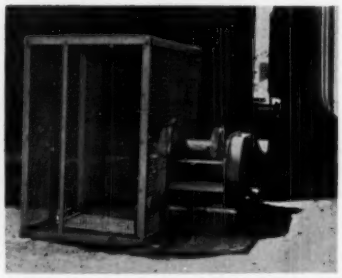
This walkway along the incline belt from crusher to storage has been equipped with a guard and also crossbars on the walk for better traction in ice and snow. Similar cleats were installed on inclined walkway of slag-dryer belt conveyor.

(Guarding pictures continued next page)





The exposed blades of this multiple lawn mower presented serious hazards to hands and feet. Two 2" x ¼" metal strips were welded over the three sets of reel type blades to prevent contact while the mower is in operation.



This enclosure guard is for the protection of the "Car Puller" operator in the event the cable should break during the moving of a railroad car. The clinker storage wall in the background created a blind corner, making it impossible to see railroad cars moving from behind the clinker storage building. Although not visible in this picture, a removable yellow chain with a sign "Danger, Look Out For Railroad Cars and Trucks" has been stretched between the car puller cage and the wall to deter traffic.

Railroad diesels and hopper cars were painted gray, creating a visual hazard. Black and yellow stripes painted on the diesels make it easy to tell when engine is in motion.

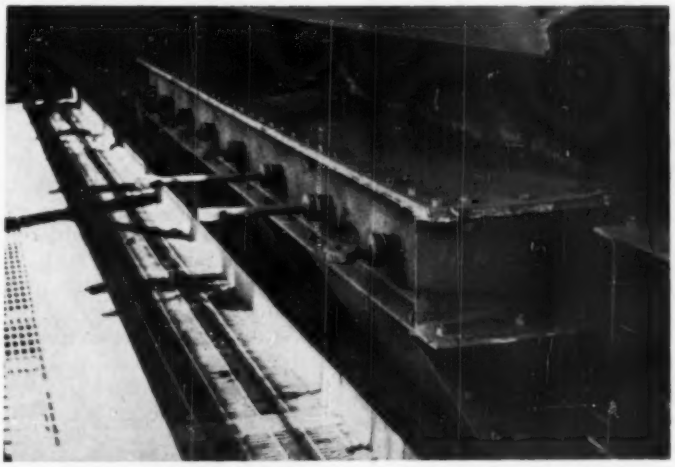
Originally, the 110 volt service and light panels were not locked because entry to them was so frequent. However, on several occasions electricians have received 110 volt shocks when someone else has turned on a circuit breaker while the electrician was still working on the circuit. A hasp has now been put on the door and the electrician can apply his safety lock during the time he is working on the circuit. To date this safety precaution has been found without fault.

In all of the 4160-volt starter cubicles, the door of the upper fuse disconnect compartment had only one lock. The electrician on each shift had a key. If a repairman had the electrician pull the disconnects and lock the compartment, there was no assurance that another repairman, maintenance foreman or operating foreman might not have the electrician close the

disconnects. With careful precautions, this dangerous situation did not produce any accidents. But to preclude any future possibilities, a new hasp was put on the disconnect compartment, permitting the repairman to use his own personal safety lock or a gang lock attachment. This safety improvement assures each repairman that disconnects are pulled before his lock is on the compartment and the disconnects cannot be closed until he removes his safety lock.

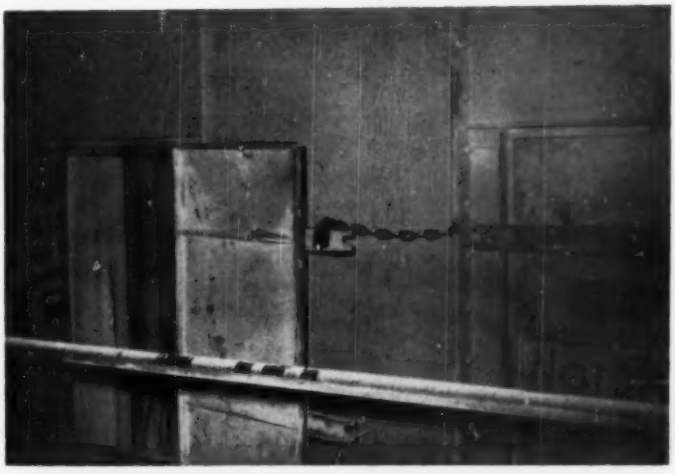
When a group of interlocked machines was to be shut down (vibrating clinker conveyors), it was necessary to push only one stop button to turn off all the machines in the sequence. On several occasions, the interlocking relay "stuck." This caused the contactor on that particular machine to remain closed, resulting in spills or in the "flooding" of the receiving machine. It was necessary to call an electrician immediately to shut down the machine while the operator kept his finger on the stop button.

To prevent mishaps of this type we have been experimenting with a small horseshoe spring developed for the Army Missile Program. The spring, which is inserted under the relay magnet and fastened to the two mounting screws, is adjusted so it will not create too much pressure and prevent the relay from closing when energized.



Considerable difficulty was experienced with hot dust hanging up in hoppers, then breaking loose and falling down during repairs to conveyors. Several serious injuries resulted from this hazardous condition. Installation of externally coated slides sealed the hoppers above the distributing conveyors, permitting maintenance work on the conveyors without the hazard of hot dust falling on the workmen.

Automatic stop on ladder leading to platform on the conveyor belt tripper.



Doors of dust collectors have to be opened at times for inspection of the interior. Because of the suction present, the doors would not stay open unless held. Chains and hasps were installed to lock the doors open during inspections.

Safety Sears
(from page 11)

Prescription safety glasses are available at a minimum cost through the First Aid Department. Employees who require corrective lenses are urged to obtain these prescription safety glasses. Visitors and vendors having business in the shop and production areas pick up safety glasses at the guard office before entering.

Under the established policy, the wearing of safety glasses is required at all times in the production shop areas and stockrooms. This includes the Prospect Plant, the Wallace Plant, the Flight Hangars and Warehouses. Safety glasses, or other approved eye protection devices, are required on eye hazardous jobs wherever these jobs are located. This policy applies to all vendors, visitors, and clerical or technical employees required to visit the various production and shop areas. About the only areas where safety glasses are not mandatory are the offices.

The eye testing and protection program was widely publicized through bulletin boards, announcements in the house organ "Cessquire," and in a letter sent direct to each employee's home, as well as by word of mouth.

The Broader Picture

That the eye protection program was a success is indicated by the dramatic reduction of eye injuries by 300 percent in two years. The eye safety program, however, was only part of the larger safety effort. Some of the other safety clothing and devices to protect personnel from injury include:

Hard hats—for employees involved in construction, moving, etc.

Respirators—required for all spray painters and available to any employee performing a job where dust, filings, fumes, etc., may cause discomfort or damage to the respiratory system.

Coated gloves—required for all persons working in processing areas.

Plastic aprons—required for all drill press operators to prevent dermatitis.

Ear plugs and muffs—for all flight line personnel.

Safety Shoes—available at near-cost for all employees.

As further protection for personnel from mechanical hazards, guards are required on all saws, belt sanders, sheers, etc., and also on exposed turning parts of any machine in the plants.

To safeguard the health of employees, special attention is given to spray painting and tool grinding operations. Water-fall paint traps and respirators are used to control the dangers involved in spray painting; and dust collectors are installed to trap dust from tool grinders. Employees involved on these operations are given annual chest x-rays and physical examinations as a precautionary measure.

The Cessna plants are fire-protected with sprinkler systems and hand extinguishers. In addition to the regular fire hazards associated with metal working and fabrication plants, three areas are given major emphasis in the fire-safety program. They are: spray painting, machining of magnesium, and the flying of aircraft which is policed by a full time fire department consisting of two crews of 12 firemen each. The water-fall traps for spray painting control the fire hazards as well as air contamination problems. Any machinist that is working on magnesium is required to post a "No Smoking" sign to guard against the accidental dropping of a match or cigarette into the shavings.

Implementing the Program

The safety programs for the Cessna Military Aircraft Division are appraised, recommended and policed by the ten members of the General Safety Committee. Permanent members of this committee are the Works Manager, Factory Superintendent, Plant Engineer and a representative from the Personnel Department. The remaining six seats are filled from the supervisory ranks of the Division.

Cessna believes that all supervisory personnel should take an active and aggressive interest in promoting safety. In order to assure that supervisors are thoroughly indoctrinated in safety procedures, they are selected to serve on the General Safety Committee. It has been found since instituting this policy that, once exposed to the dividends which safety consciousness pays, supervisors actively pursue and contribute to the overall effectiveness of the program. Furthermore, it has been noted that the personnel of their respective departments proportionately reflect in their actions the safety alertness of their supervisors.

A full-time first aid department is maintained, with weekly visits by a medical doctor and an optometrist to serve the health needs of employees. Day-to-day safety, health and facility problems are handled by consultation and liaison between the General Safety Committee, Supervision, Company Doctor, Insurance Carrier, Personnel and other involved parties.

(Continued on page 22)

WHAT IS IT?

It is present wherever metal is worked.
It isn't very big in relation to a man.
It has no means of self-propulsion . . . and no guidance system.
Yet, it could be called a missile—an UNGUIDED MISSILE—which might have caused a man to lose the sight of an eye.
What is it? What happened? For the answers, see page 22.

CUE FOR CORROSION CONTROL

An unusual combination of process factors and plant conditions recently presented an extremely difficult corrosion-control problem in the acid-processing facility of a prominent midwestern producer of fertilizers and related products.

High heat, humidity, moisture, acid fumes, fertilizer dust, and equipment vibration were the villains. All teamed up to create a severely corrosive atmosphere—so corrosive, in fact, that the felt-and-asbestos-covered, zinc-coated protective panels sheathing the structure failed after only four years' service.

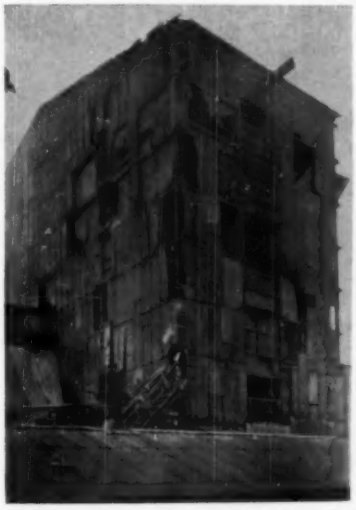
This section of the plant, built in 1954, houses large rotary kilns and other heavy equipment for grinding and processing fertilizer. Operation of these units caused considerable structural vibration. This condition was further aggravated by the fact that the building, 90-ft. high and only 40-ft. wide (shown in accompanying photos), lacked sufficient steel bracing to cope with and compensate for this factor.

Consequently, it was not long before continuing vibration ruptured the protective coating of the original metal panels at fastener points. The resultant capillary action, combined with the cumulative corrosive effects of high heat, humidity, moisture, dust, and a mixture of acid fumes, soon exacted their destructive toll, making replacement of panels necessary. (Figure 1)

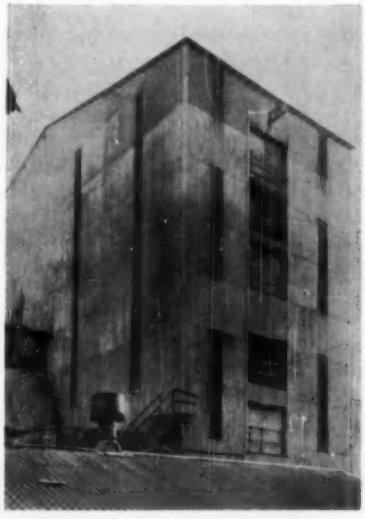
Therein lay the crux of the problem. It was not simply to replace the deteriorated panels with new units; rather, it was to replace them with paneling which would provide the broad-scale protective value so desperately needed here to successfully stave off the corrosive onslaught of the materials and processing factors involved.

To combat corrosion in other plant areas, officials of this company had previously installed grey opaque fiberglass-reinforced polyester panels made from a special fire-retardant, chemical-resistant polyester resin.

It is one of a unique series of polyesters which in recent years have become extensively used for ducts, stacks, hoods, fans, tanks, trays, ejectors, hoppers, covers and other equipment to meet exceptionally demanding corrosive service requirements in chemical plants, paper and textile mills, metallurgical plants, and numerous other industrial applications.



Felt-and-asbestos covered, zinc-coated panels show effect of four-year exposure to heat, humidity, acid fumes, vibrations.



Same structure as shown above after it received a refurbishing with panels of opaque fiberglass reinforced plastic.

Because of previous successful experience with these unique protective-decorative panels, this fertilizer manufacturer believed they would provide the answer to their acid-plant corrosion problem. But officials wanted to be as certain of this as possible *before* using them in a sizable installation. Accordingly, the paneling was tested continuously for three years by actual plant exposure as well as by immersing sample strips in various acids at different temperatures.

Results of the coordinated, grueling testing program and other factors led to the decision to clad the walls with this paneling. Approximately 19,300 square feet were covered with panels, which were 29-in. wide and in lengths of 7½ feet and 11½ feet. Altogether, some 950 panels were installed and fastened with 305 stainless fasteners. Prior to their installation, the building was stiffened with steel bracing to counteract the factor of vibration resulting from equipment operation. (Figure 2)

Also important from the vibration standpoint is the fact that the panels, being plastic, have a flexing action, a characteristic which makes them well suited for service where this operating condition is encountered. Again, the paneling provides excellent resistance to the combination of chemicals handled in process—chlorine, phosphorus, ammonium nitrate—and remains unaffected as well by moisture, heat and humidity.

An important additional benefit gained in this instance is the factor of fire-resistance, provided by the inherently high fire-resistant properties of the self-extinguishing polyester resin used in fabricating the paneling.

Significant from the cost standpoint, the paneling is comparatively easy to install. It cuts, saws, drills cleanly; and because it is light

Another Injury Checked

The Unguided Missile

That "unguided missile" shown on page 20 is an ordinary punch in the hand of James Lau of the Tool & Die Department of Schlage Lock Company in San Francisco. In the picture above he is demonstrating how he was using the punch with a hammer to remove a gib from a die.

Suddenly the hammer glanced off the head of the punch, causing the punch to spring backward with considerable force into the left lens of his glasses.

The glasses were safety glasses—and although the left lens shattered, they did protect his eye from injury.

In reporting the accident, it was Safety Director Corbin Easterling's great pleasure to circle one word as follows:

TYPE OF INJURY: (NONE)

Pictures by courtesy of Schlage Lock Co.

Plant Maintenance & Engineering Show

Chicago will be the site of the twelfth annual Plant Maintenance & Engineering Show, it was announced by Clapp & Poliak, Inc., New York exposition management firm which produces these events. The show will run for four days, from January 23 through 26, 1961, at the International Amphitheatre. The conference will run for three days, January 23 through 25. Morning sessions of the conference will take place at the Amphitheatre and evening sessions at the Palmer House.

Large Attendance Expected

These events have been staged in Chicago only three times in the past—in 1954, 1955 and 1958. The greatest attendance and the largest exhibit area have characterized the show when it was held in Chicago previously.

The 1961 exhibit area is expected to exceed six acres and about 375 companies are expected to participate as exhibitors. The theme for the 1961 show will be "The Maintenance Operation Meets the Needs of Increased Production."

Visitors who wish to receive advance rapid registration cards, hotel or conference information should write Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N. Y.

in weight, it can be handled and installed in the field with maximum speed and efficiency.

While it has been common practice in fertilizer plants to use asbestos cement for combating corrosive conditions, experience shows that replacement of old style panels is a frequent occurrence—and no easy task in view of the weight, fastening and handling problems involved with this type paneling. In contrast, reinforced polyester panels are quickly and easily installed and require little or no maintenance attention throughout their long life.

Wall louvre equipment, 18-in. gravity-type roof ventilators, flashing, and trim in this installation were also fabricated from similar materials. This fall the remaining area of the acid-processing plant (an additional 1,000 sq. ft.) was clad with this paneling.

Completion of this major renovating project provides built-in protection against fire and the corrosive effects of heat, humidity, fertilizer dust, moisture, acid fumes, and equipment vibration. Amortized over a long period, the paneling is expected by plant officials to yield maintenance savings far exceeding the cost of installation. Such economies are especially welcome to profit-minded plant operators in these days when so many costs continue to climb and every penny saved can mean another dollar earned.

Pictures by courtesy of Durez Plastics Div., Hooker Chemical Corp.

Safety Soars
(from page 20)

Cessna officials and the General Safety Committee have instituted a continuous search for new and improved safety methods and devices, utilizing those appropriate in aircraft production. Soon to be published is the company's own "Employee's Safety Handbook," one of the first designed for the aircraft industry.

For a high-flying safety record it takes a lot of down-to-earth safety effort. But Cessna's two million man-hour safety record proves it can be done!

Pictures by courtesy of Cessna Aircraft Company.

SAFETY RULES FOR CONVEYORS

Familiarity breeds danger. Experienced lion tamers can get caught off guard by animals. The most careful drivers are susceptible to "highway hypnosis"—the sense-dulling road menace. People become too familiar with easy routine—don't recognize danger!

Each year, thousands of industrial workers are injured at their jobs for this very reason.

They become accustomed to the powerful machines that relieve them of exertion. This tends to make them careless, unaware of potential peril.

The man with a consistently good safety record **knows** that accidents have causes. He doesn't have to learn the hard way.

The hobbyist in his own shop and the housewife in her own kitchen know the dangers of the mechanical aids they use. They keep alert.

But on the job they are often lured into "machine hypnosis" by the smooth, easy rhythm of production and materials handling equipment.

Conveyors are used more widely throughout industry than any other type of heavy machinery, yet less than 1 percent of all accident compensation cases involve conveyor equipment.

Experience shows that hitchhiking a ride on a conveyor is equivalent to flirting with danger every step of the distance.

This impressive record exists because conveyor manufacturers realize the potential danger in any power machinery—and do all they can to educate operators to the facts.

The Conveyor Equipment Manufacturers Association has made available safety rules for plant workers. They warn:

- **Use a conveyor only for its designed purpose. This means, especially, that you should not ride on any conveyor if it is not intended to convey YOU.**
- **Avoid loose clothing or accessories that may be caught in machinery or moving materials. Long neckties, open sleeves, and open jackets are hazards for men.**

Long, loose hair, bracelets and beads can mean danger for the female workers.

- **Be a good housekeeper. Aisles should be as clear as possible at loading and unloading points. Spilled liquids, grease or powdered materials should be cleaned up immediately, lest someone slip and fall onto moving equipment.**
- **Even before you begin work around a conveyor, find out where controls are located. Don't hesitate to use them when necessary. Stop motors before attempting to clear a choked conveyor.**

(Continued on page 27)

Baubles, bangles and beads spell DANGER near conveyors, machinery. For men, neckties, long sleeves, open jackets are OUT.

Fig. 1 Do you have to carry a load upstairs or for some distance? Place it on a table and turn your back to it.

Fig. 2 Get a good grip and you're on your way. At your destination, just reverse the process—back up to table.

How to Make

A Long Haul

Easy

Some Tips on SAFE Lifting

by **CHARLES ALLEN PEASE**
Supervisor of Physical Education
University of California
Berkeley, California

When we look at the complicated structure called the spinal column, with its 33 vertebrae, each with seven processes which seem to be sticking out in all directions, we realize that here is a mechanical structure which can get out of order.

Then, if we could see the mass of ligaments, discs, and muscles that hold this structure together and make it move, we would be amazed that it is **ever** in good working condition! But it **does** work, and it **does** give tremendous service over the years—if we take care of it!

We can compare our body to a derrick when we lift a weight from the ground. Our feet form the base upon which the platform (our hips and thighs) may turn; the spinal column is the boom from which our arms hang as the hoisting cable.

To operate a derrick, the engineer will turn the platform toward the object to be lifted. He will set the boom at the desired angle over the weight. He then will drop the cable and fasten it to the weight.

When everything is set, the engineer then takes up on the hoisting cable to lift the load. If any other movement of the load is desired, it is done **after** the cable has taken the load off the ground.

When a person desires to lift a load from the ground he must operate like the derrick.

First: Set the feet.

Second: Place the trunk of the body above the weight so that the arms will hang straight down to it.

How to Lift

Fig. A. Stand the carton on one corner.

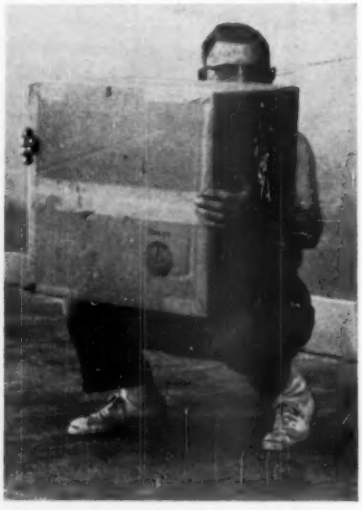


Fig. B. Roll it onto your knees.

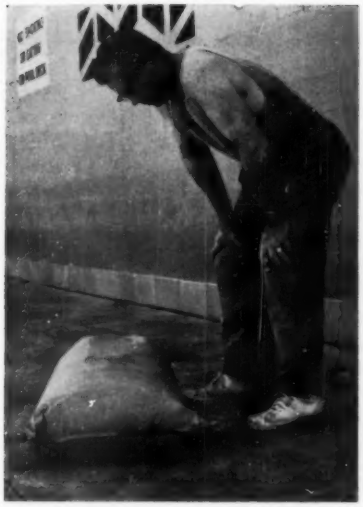


Fig. 1 How'll I get this off the ground?

Fig. 2 Stand it up between knees.

Fig. 3 Roll it over your knees.

How to Lift Bagged Materials

Third: Set the muscles of the legs, hips, and back ready to take the strain.

Fourth: Lift the weight with the arms to get it off the ground, then straighten the legs and back.

This method of lifting will prevent back strain if everything is in good working order.

In this mechanical age, we either learn to care for a machine, or we employ someone to overhaul or remake it to keep it in perfect working order.

But we fail to keep our bodies, which are machines in a sense, in even fair working condition.

One needs only attend a luncheon club meeting to see examples of excellent machines "going to waist" from too much fuel and not enough good use of the equipment.

In other words, our businessman of today is too well-fed and too soft to be prepared for emergency action.

It is to this lack of physical condition that we can trace many of our back injuries.

If we could classify the type of individual who is most likely to have a back strain, we would pick the ex-athlete who has been sitting at a desk for about ten years, is 15 to 50 pounds overweight, and believes he is in just as good condition as he used to be.

This individual, when placed in an emergency situation, acts on the impulse—as he would have done ten years before when he was in top condition. He picks up the load; and in so doing, something "puts a kink in his back," and he is on the bench for two or three weeks or more.

How the Professionals Do It

A well-conditioned and trained back can enable one to lift unbelievable weights.

Paul Anderson, the world cham-

Fig. 4 Pull it close to your trunk.

Fig. 5 Stand up with the load. Your back is straight, so there's no strain.

Cartons

Fig. C. Pull it to you and stand up.

pion weightlifter, has pressed 407¾ pounds over his head and has a total of 1129½ pounds in the three Olympic lifts. His best lift, unrecognized by officials, was 436½ pounds.

A Russian lifter, N. Stogov, weighing only 123 pounds, lifted 286½ pounds over his head in the lift known as the "clean and jerk."

Our problem is not one of what is possible, but one of condition and training. Knowing how to lift can improve the performance as well as prevent injuries.

Let us see a weightlifter in action and analyze the action.

First: Stand close to the weight with feet a walking step apart. Set the feet parallel to form a good base.

Second: Bend the knees and hips to grasp the bar measuring the distance.

Third: When the distance is measured and position is comfortable, grasp the bar with hands more than shoulder width apart. Then set the muscles of the legs and back.

Fourth: From this "set" position, lift the weight off the floor with the arms, followed by extending the back and legs in that order. The height of the lift depends upon the amount of effort put into the flexion of the arms and the extension of the back and legs.

In the entire lifting process the weight is carried as close as possible to the supporting column. The spinal column is locked in a vertical position before the legs are fully extended.

Follow the Pattern

How can we apply the weightlifter's technique when lifting something on the job or when working about the home?

In the first place, the bar is about nine inches off the ground—so that it does not require a complete contraction of the legs and trunk.

When the legs and trunk are tightly contracted and a load must be lifted from that position, a much greater strain is placed on the back than if it were locked in a partially extended position.

So to follow the weightlifter's method:

Get the object as high off the ground as possible by standing it up, if it is a sack, or by standing it on one corner or edge if it is a box.

Next, move in close so that the object to be lifted is between the knees.

Set the muscles of the legs and trunk; and with arms and hands, roll the object over the left knee (if you are right-handed), pull the object close to the trunk, then stand up with it.

With a little practice one will learn to roll the object over his knee, and there will be very little strain placed on the back.

The main points to safe lifting are:

1. Get the center of the weight as high above the ground as possible. (Stand it up if it is a sack. Stand it on a corner if it is a box.)

2. Get the object as close as possible to the supporting column (your backbone).

3. Set the feet, legs and back (back as nearly vertical as possible).

4. Lift with the arms first, and roll the object over your knee.

5. Pull the object as close to you as possible.

6. Stand up with the load, using the legs, thus placing little or no strain on the back.

7. Now turn your FEET if your assignment requires turning, NOT your hips or shoulders.

The question is not so much how to lift correctly, but how, in this mechanical age, we can keep ourselves in physical condition so that we can do the work required in an emergency.

In other words, how can we keep our back muscles in good condition when we have little need for the use of muscular strength in our work?

The only solution is to do something that requires the use of muscles—such as calisthenics, active recreational games, swimming, bodybuilding with weights, or strenuous work in the garden.

Whatever is done should be done regularly, at least three times a week, otherwise the muscles will continue to be sore and stiff.

The following exercises will help maintain good muscular condition, providing you have no back trouble. If you *do* have back trouble, consult your doctor about exercising.

1. Stand with your feet apart, knees locked, and reach behind your heels, touching the floor with your fingers.

2. Lie on a rug or carpet, lift your feet and legs up, swinging them up over your head, and touch the floor with your feet. Then roll up to a sitting position with knees locked, and touch your toes with your hands.

3. Take a position lying face down on the floor, arch your back, and rock forward and back like a rocking chair.

4. With someone standing by to hold your feet down, lie face downward, placing the top of your hips at the forward edge of a strong bench, stool, or chair, and lift your head and trunk as high from the floor as possible by arching your back.

By Courtesy of the "California Safety News."

Atomic Industrial Forum

Nuclear Frontiers—a Challenge to Industry has been set as the theme of the 1960 Annual Conference of the Atomic Industrial Forum, to be held December 14, 15, and 16 at the Fairmont Hotel in San Francisco, California. The conference is being held in conjunction with the Winter Meeting of the American Nuclear Society and the AIF-ANS AtomFair-West, December 12–15.

The three-day Forum conference will cover such topics as: the role of nuclear energy in space explorations; the impact of public attitudes on atomic energy progress; problems in industry-government relations; advanced nuclear technology; international atomic developments; and progress in radiation and radioisotope application.

A complete preliminary program and registration information is available from: Conference Manager, Atomic Industrial Forum, 3 East 54th Street, New York 22, N. Y.

Complimentary tickets to Atom-Fair-West are available on letterhead request from: Exhibit Manager, Atomic Industrial Forum, 3 East 54th Street, New York 22, N. Y.

Safety Seminars

The man new to the safety field can hardly be expected to perform effectively in the job without his own thorough indoctrination into the most modern principles and techniques of industrial safety management.

To help him get this kind of training, the Personnel Division of the American Management Association is offering a special orientation seminar for men newly assigned to the safety field. The meeting is called "Administration of the Plant Safety Program"—Nov. 2–4, 1960. At the meeting, registrants will learn why safety is a vital function of modern management . . . how management safety policies are developed . . . the place of the safety department in the industrial organization . . . the safety department's scope of responsibilities . . . objectives of an organized safety program . . . essential elements of a successful safety program . . . common problems of safety administration . . . and measuring and reporting results.

Closely related to safety is the matter of employee health. An AMA workshop seminar offers a chance to explore all the facets of industrial health exams and how they can make a more positive contribution to over-all company objectives. The seminar is called "How to Use Health Exams in Industry"—Nov. 9–11, 1960. This small discussion group will cover pre-employment health exams . . . periodic exams of supervisory and non-supervisory personnel . . . periodic health exams for executives . . . physical exams after illness, injury, or absence . . . departure exams . . . matching job requirements with physical fitness . . . emotional aspects of health exams . . . record keeping and reporting . . . and public and industrial relations aspects of health exams.

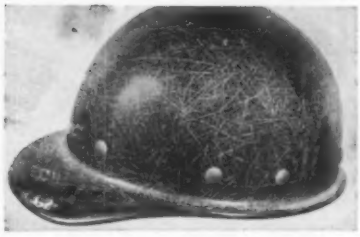
Another important aspect of employee welfare and productivity is the company recreation program. A specialized AMA workshop seminar covers "The Company Recreation Program: An Integral Part of a Sound Personnel Program"—Nov. 9–11, 1960. Personnel executives will analyze the purpose, scope and potential value of employee recreation programs . . . decide what activities should be included . . . define the various types of employee organizations . . . examine program administration and financing . . . develop ways to increase participation and evaluate effectiveness.

A SAFETY IDEA

Glowing Hard Hats For Added Safety

Phosphorescent helmets have been issued to the entire field force of Malan Construction Corp., New York, N. Y., at the General Motors Wilmington, Del. plant, now under expansion. The contractor said the new hard hats, which are always worn as protection against any falling object, have the added advantage of throwing off a blue-green glow in darkness. Malan executives see this as another safety factor. The helmets make men more visible when working in deep excavations or in dark areas such as tunnels, mines or under building formwork.

The safety hats are made of reinforced fiberglass and have qualities which resist impact, penetration, flammability, water absorption and weight.



Because of the excellent response from the field, Malan Construction, one of the country's largest contracting firms, has decided to replace all the existing hard hats, now found on all their other projects scattered throughout the country, with the new-type phosphorescent caps. Men have welcomed the smart looking light-blue helmets that can be recharged in five minutes by any strong artificial light or by longer exposure to sunlight.

Picture by courtesy of Fibre-Metal Products Co.

ABCB Convention To Feature Safety

Safety will be one of six topics to be discussed in special meetings planned as features of the 42nd annual convention of the American Bottlers of Carbonated Beverages, November 14–17, in Detroit.

This service will be discussed by the attending ABCB members in the light of how it is best applied to the soft drink industry. Executives of companies representing the safety causes are urged to attend the coming convention.

Safety Rules for Conveyors

(from page 23)

• Consider workers further along the line. Load carefully so that materials will not fall off. Remember corners and low clearance overhead. Don't overload.

• Call your foreman or a maintenance man for repairs. Don't try to fix something that may be more complex and dangerous than you suspect.

• Shut off machinery when it will be unattended. You never know who may have an unscheduled appointment with an accident.

• There is no excuse for horseplay anywhere in industry, but clowning it up around moving machinery is especially dangerous. A practical joke is the least acceptable excuse for an accident.

• Familiarity with your mighty mechanical workmates can breed danger. Familiarity with their accepted rules for operation is your surest accident prevention!

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Psychology of Safety

A new publication from the New York University Center for Safety Education contains two important papers:

1. **Accidents and Life Experience,** by Flanders Dunbar, M.D., Ph.D., Med.Sc.D.

2. **Accidents and Attitudes,** by Leon Brody, Ph.D.

Dr. Dunbar is a world-famous psychiatrist whose classic approach and extensive clinical experience are reflected in her clearly written and highly informative paper on **underlying causes of accidents.**

Dr. Brody, Director of Research at the Center, has tackled in his paper the complex and elusive problems of attitudes, a topic that today seems to rank at the top of the list in the minds of **safety educators, driver educators, licensing authorities, enforcement officials and specialists in industry.** An extensive bibliography is included.

Both Dr. Dunbar and Dr. Brody refer to specific applications of knowledge along preventive and corrective lines.

Single copies of the pamphlet are available for $.50 from: Center for Safety Education, New York University, Washington Square, New York 3, New York. Please make checks or money orders payable to: Center for Safety Education, N.Y.U.

N. Y. Workmen's Compensation Law

A new edition of the New York workmen's compensation law pamphlet has been published by the Association of Casualty and Surety Companies. The Association said the revised pamphlet incorporates important changes in the New York law. It contains a digest and complete text of the workmen's compensation law and pertinent supplementary laws, including all amendments enacted by the 1960 legislative session. Annotations of cases decided since publication of the last edition also are included.

Copies may be obtained from the Editor, Law Publications, Asociation of Casualty and Surety Companies, 60 John Street, New York 38, New York at $1.50 each, plus applicable sales tax, which price includes any supplement issued prior to republication of the pamphlet.

Sealed Gamma Radiation

Protection Against Radiations from Sealed Gamma Sources, National Bureau of Standards Handbook 73, (70 pages, 30 cents) can be ordered from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

This Handbook contains the recommendations of the National Committee on Radiation Protection and Measurements (NCRP Report No. 24). One of the primary considerations leading to its preparation as a revision of Handbook 54 has been the modification of the recommendations of the maximum permissible radiation exposure to man. In addition, greater distinction has been made between mandatory recommendations and those which are advisory only. Although the objective of the NCRP recommendations is to provide authorita-

tive information rather than material to be used for legislative purposes, several states and local authorities have based their protection codes on the NBS handbook.

The present Handbook deals with protection against sealed gamma-ray sources and with discrete gamma-emitting sources that are not technically "sealed" but that may be treated in the same manner. The former include radium, radon seeds, cobalt-60, and cesium-137; the latter include iridium-192, gold-198 wires and seeds, etc. The general principles outlined are applicable to all sources of these types. No specific references are made to industrial applications; however, the basic principles and the attenuation data of this Handbook are applicable to both medical and industrial uses.

Electric Shock Hazards

With the ever-increasing mechanization of American industry, workers in numberless occupations find they can work better, easier, and more safely because of the assist they get from the machine, power-tool, or other mechanical device.

There's a catch, though.

Most of the machines and power tools used in U. S. industry today are run by electricity. Thus, a rapidly-growing number of workers in nearly every industry are becoming exposed to the hazard of electricial shock. Man's powerful servant often turns against its master with serious injury or death of the worker as a result.

"Use of electricity for power, light, and processing operations is so universal that we accept it with only an occasional thought of its ability to harm or destroy," says the U. S. Department of Labor in a new bulletin on "Control of Electrical Shock Hazards," released by the Bureau of Labor Standards.

The fact that electricity is now so commonplace throughout industry—and in the home and office as well—the tremendous number of people exposed to electrical hazards, and the numerous injuries, many of them fatal which occur each year, all combine to make the prevention of electrical shock accidents a matter for widespread concern, the bulletin states.

Shock danger from the ordinary 120-volt circuits—the so-called "low-voltage" found nearly everywhere in America—is the main concern of the Department's new publication, although high-voltage current and static electricity also are dangerous.

"Low-voltage" as a name for the common, garden variety of electrical circuits, is deceiving because many people think that "low-voltage" means low hazard. This isn't so, the bulletin points out, because voltage is only one of several factors that determine how dangerous electricity can be to humans.

Seasoned electrical workers have a healthy respect for ordinary "low-voltage" house current. Their attitude: "Even if it is only a hundred and twenty, it can kill you if you get it solid." Translated, this means

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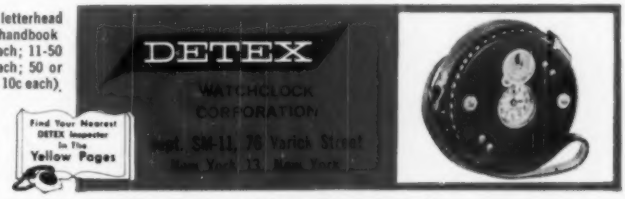


(For details, use Key # Y-5 on card on page 1)

NO TIME OF YEAR FOR TB. Is there ever a right time? Of course not. But Christmas, more than any other season, should be a time of glowing good spirits, health and happiness. In the fight against TB, it can at least be a time of hope—when millions of healthy Americans take an extra moment to help with each Christmas Seal they use. ✝ Give that spark of hope —and the needed help—by using Christmas Seals. What could be more fitting for a season of good will to men? ✝ Answer your Christmas Seal letter today.

simply that "low-voltage" current can be—and frequently is—a killer under certain conditions.

The Department's new bulletin (Number 216) is the first in a series to be issued dealing with physical and mechanical hazards in industry, but much of it can be used by the average householder and home workshop enthusiast who uses electrical equipment.

Chief topics covered by the publication include: how electricity acts; how shock occurs; typical electrical shock hazards; and methods for controlling hazards. Common unsafe physical conditions and unsafe acts of persons are outlined, together with suitable control measures.

Copies of Bulletin No. 216 may be purchased from the Superintendent of Documents, Government Printing Office, at 15 cents each. Single copies are obtainable upon request, so long as the free supply lasts, from the Bureau of Labor Standards, U. S. Department of Labor, Washington 25, D. C.

Ultraviolet, Infrared & Mass Spectral Data

The first in a proposed series of spectral data sheets on organic compounds has been published by the Manufacturing Chemists' Association. The information was compiled by the Carnegie Institute of Technology through a project sponsored by the MCA.

The first issue contains ultraviolet, infrared and mass spectral data. Later issues, to be made available at six-month intervals, will contain Raman and nuclear magnetic resonance spectral data also.

The data on physical and spectral properties is compiled to help industrial laboratories identify processing fractions as well as pure compounds.

The data on spectral properties help in making rapid spectrographic analyses of plant streams and product materials in manufacturing processes, as well as identifying individual compounds in analytical and research work. The data on thermodynamic properties permit the making of reliable calculations of heat balances and evaluation of chemical equilibria occurring in industrial processes.

The MCA-sponsored research on spectral properties was begun at Carnegie on July 1, 1959. It is integrated with the MCA sponsored work on physical and thermodynamic properties initiated in 1955. The spectral project is similar to the American Petroleum Institute Research Project 44 on hydrocarbons and related compounds.

The availability of such data assists industry in utilizing raw materials to greater technological advantage.

An important by-product of this MCA research project is the encouragement of fundamental research on chemical compounds in universities here and abroad. The information is made available to universities free of charge.

Directors of the MCA projects are Dr. Frederick D. Rossini and Dr. Bruno J. Zwolinski. Dr. Alfred Danti is in charge of the work on spectral data. All are Carnegie staff members.

Copies of the spectral data sheets are available on an annual subscription basis at 10 cents each; the physical and thermodynamic data sheets are 5 cents each. Address: Manufacturing Chemists' Association, Inc., 1825 Connecticut Ave., N. W., Washington 9, D. C.

Flammable Liquids Storage Guide

Publication of the third of a new Safety Guide series entitled "Flammable Liquids: Storage and Handling of Drum Lots and Smaller Quantities" has been announced by Manufacturing Chemists' Association, Inc.

The new guide gives safety recommendations for both inside and outside drum storage, methods of dispensing from drums, drum filling from storage tanks, containers for use of flammable liquids and also offers other applicable safety suggestions.

Copies of the guide designated as SG-3, are available at 20 cents each from the Manufacturing Chemists' Association, 1825 Connecticut Avenue, N.W., Washington 9, D. C.

THE FIRE FRONT

Firemen's Injuries

Safety is everyone's job but it is management's responsibility to see that safe working habits are developed, that unsafe conditions are eliminated, and that prudent care be taken at all times.

That's what Henry J. McFarland, director of the Municipal Service Division, New York State Department of Civil Service, told 2,000 persons attending the 87th Annual Conference of the International Association of Fire Chiefs held in Rochester, N. Y., on September 13th.

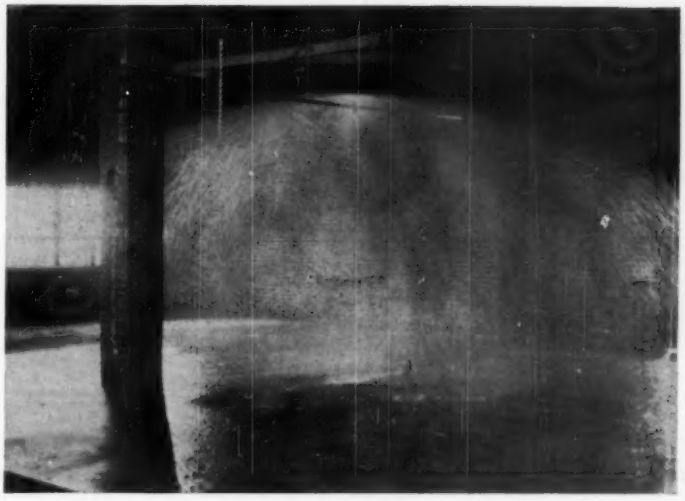
Speaking as chairman of IAFC's Committee on Civil Service Classifications, he urged the fire chiefs to set up committees of officers and men in their local departments to work towards eliminating causes of on-job accidents.

A new in-service safety publication, just released by the IAFC, outlines procedures to follow. It discloses that on-job injuries to firefighters are seven times greater than those in industry and that the death is three times greater.

August Losses Rise

Estimated fire losses in the United States during August amounted to $90,037,000, the National Board of Fire Underwriters has reported. According to Lewis A. Vincent, general manager, this loss represents an increase of 20.6 percent over losses of $74,660,000 reported for August 1959, and an increase of 8.5 percent over losses of $82,998,000 for last July.

Losses for the first eight months of 1960 now total $747,006,000, an increase of 4.1 percent over the first eight months of 1959, when they amounted to $717,860,000. These estimated losses include an allowance for uninsured and unreported losses.



Spray pattern of standard automatic sprinkler.

FM Research Reduces Fire Protection Costs

A change in sprinkler-installation requirements has recently been adopted by the Factory Mutual Insurance Companies. It is an important step forward in lowering the cost of automatic-sprinkler protection.

All fires involving ordinary hazards can be controlled through automatic sprinklers with adequate water. (The full-scale library fire tests at the Factory Mutual Engineering Division at Norwood, Massachusetts, last December demonstrated the effectiveness of sprinklers in a field that had previously been doubted.)

The problem has been to find out just how few sprinklers would be required under different conditions of building construction and occupancy. Continuing research has determined that a reduction of up to one third in number would be feasible for some types of construction. In many cases substantial dollar savings would result.

In 1952 the Factory Mutuals developed a new sprinkler head which distributes the water more evenly in a wide umbrella-shaped pattern. That design is now standard in the industry. Extensive field and laboratory tests have now determined that it is not necessary to penalize wooden construction with ordinary occupancies by reduced sprinkler spacing.

Meanwhile, the millions of sprinklers in existing systems will continue to give excellent protection. Unless local conditions are unusual there is no need to replace the old-type sprinklers. Always good, sprinkler protection is now better. Research has made it better —and less expensive.

Picture by courtesy of Factory Mutual Engineering Div.

New System Suppresses

Engineers of a leading manufacturer of fire detection devices and temperature controls, recently demonstrated a unique, patented system said to offer active, rather than passive, protection against accidental explosions. The explosion protection system detects an explosion at the instant of its inception, and acts within a few thousandths of a second to literally snuff out the blast before it can become destructive.

At a press conference high speed motion pictures illustrated the speed and effectiveness of explosion suppressing action in slow motion. The sytem is said to be capable of dealing effectiveiy with a vast majority of the ordinary explosion hazards known to exist throughout industry.

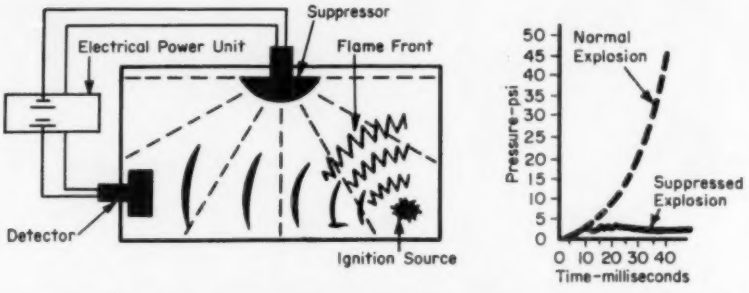


Fig. 2 Digram illustrates the basic suppression system. The detector senses the incipient explosion and the suppressing agent is dispersed explosively. The agent extinguishes the explosion flame by chemical action and cooling, and also inerts the unburned explosive mixture. The graph shows the comparison between a normal explosion curve and a supressed one. Note the low pressures attained in a suppression.

English Development

The system is based upon a British World War II development designed to prevent explosions in aircraft fuel tanks hit by incendiary shells. After the war, a British concern successfully adapted it for industrial use. Applications in England are estimated to have prevented losses of several millions of dollars since 1954, and no destructive explosions have occurred in protected equipment. In bringing the system to this country, the American manufacturer has obtained exclusive U. S. and Canadian manufacturing and sales rights

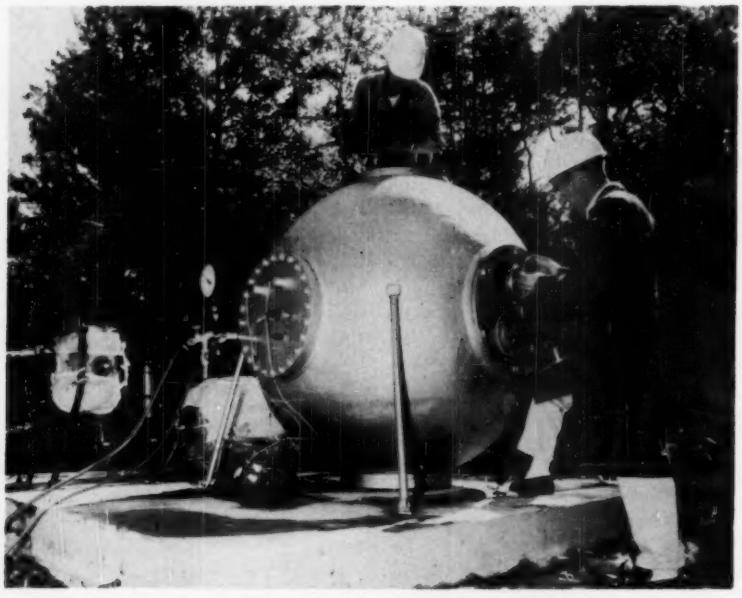


Fig. 3 Three of the special explosion chambers which engineers use to study the characteristics of various types of explosions. Suppressors are being installed in the largest, 67-cubic foot spherical chamber for another test.

Fig. 4 An explosion is about to be triggered from the control house, located some distance from the explosion area. Effects of the explosion are indicated upon the oscilloscope and recorded photographically.

Explosions

for the system, designed and modified to meet specific U. S. requirements.

The system has been successfully applied to several installations in the United States, and has been proven, either in service or in tests, to be capable of handling most industrial explosion hazards. Its principles can also be adapted to nuclear, missile, aircraft, marine and a variety of other hazardous equipment.

Fig. 1 Fire is one of the destructive results of an explosion. In 1958, explosions in this country are known to have caused damage of over 25 million dollars. Experts estimate the actual losses to have been close to 100 million dollars.

Significance

Nearly every process industry, such as chemical, petroleum refining, plastics, and milling, has an explosion hazard. Certain metallic dusts create an explosion problem in the metalworking industry. The potential exists in conventional thermal, as well as atomic, power plants. Wood flour and wood dusts are hazardous. Explosions are particularly destructive aboard ships, aircraft, missiles and their launchers, and military vehicles of all types. Table I lists some specific industrial hazards. It could be extended almost infinitely.

The potential value of the explosion protection system, which takes up where purely precautionary measures leave off, is shown by data compiled by the National Fire Protection Association. The NFPA records the following reported losses and their causes in 1958 alone:

Explosions— Miscellaneous & Unclassified	$ 25,178,000
Unknown & Undetermined Losses	$ 287,833,000
Total Losses During 1958	$1,056,000,000

It seems safe to assume that explosions caused 10 percent of the total, or about $100,000,000, since many of the losses from unknown

TABLE I SOME INDUSTRIAL EXPLOSION HAZARDS

INDUSTRY	*HAZARDS*
Aircraft and missiles	Exotic fuels; fuel test cell facilities
Agricultural products	Grain mills; solvent extraction operations
Chemical processing	Complex hydrocarbons; plastics; insecticides; exotic fuels; ozonides; hydrogen peroxide; organic peroxides; and many others
Metalworking	Large scale painting and dipping; ovens and furnaces; paint drying; new metals such as sodium, titanium, zirconium, uranium, etc.; dusts of combustible metals; large boiler installations (common to many industries)
Paint and varnish	Synthetic resins and varnishes
Petroleum refining	Inherent hazard aggravated by new production techniques
Rubber	Hazardous monomers used in synthetic rubber and latex production
Petrochemical	Similar to chemical and petroleum refining and derived from both
Pharmaceutical	Solvent extraction in antibiotic production; complex molecule production
Pulp and paper	ClO_2 and HO_2 bleaching operations; wood flour milling
Power generation	Pulverized coal; boilers themselves
All industries	The human element

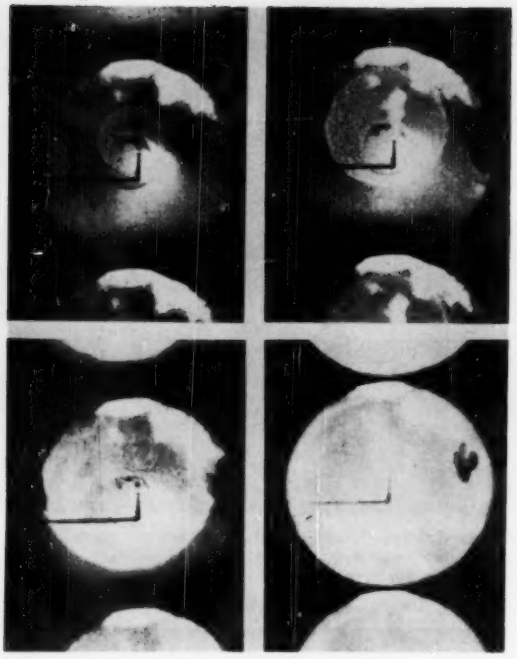


Fig. 5 Still photographs from single frames of motion pictures taken at 1000 frames per second show the development of an unsuppressed blast in a spherical explosion chamber. At top left the dim circle of light just above the center of the chamber shows the fireball a few thousandths of a second after ignition. This fireball expands and grows in intensity until after about 50 milliseconds (one-half of a tenth of a second) it fills the entire chamber (bottom right). "L" shaped bracket supports the explosive material in chamber. Small circle of intense light in center of chamber is sunlight entering through porthole of opposite chamber.

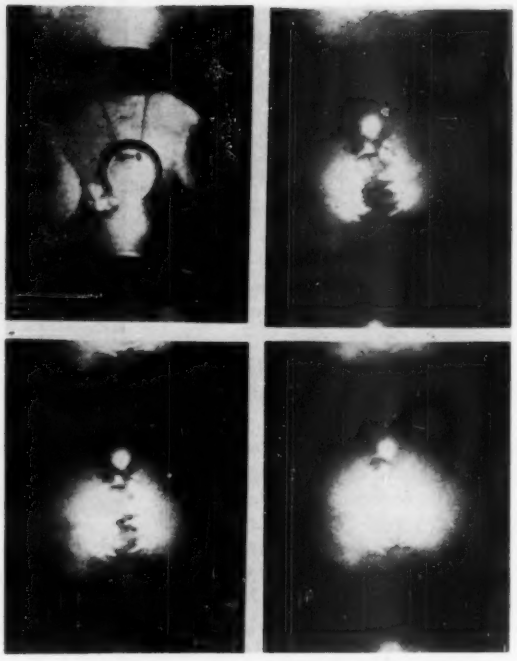


Fig. 6 Still photographs from single frames of motion pictures taken at 1000 frames per second show the suppression of the same type blast as in Fig. 5. A few milliseconds after ignition (top left) the suppressors, located at each side of the chamber, have already begun to discharge suppressant. Succeeding frames show the suppressant mist progressively enveloping the fireball. Leading edges of the two advancing fronts of suppressant mist reflect the intense light of the explosion which is being snuffed out. At lower right the explosion fireball is completely enveloped by suppressant and all but extinguished in less than 50 milliseconds.

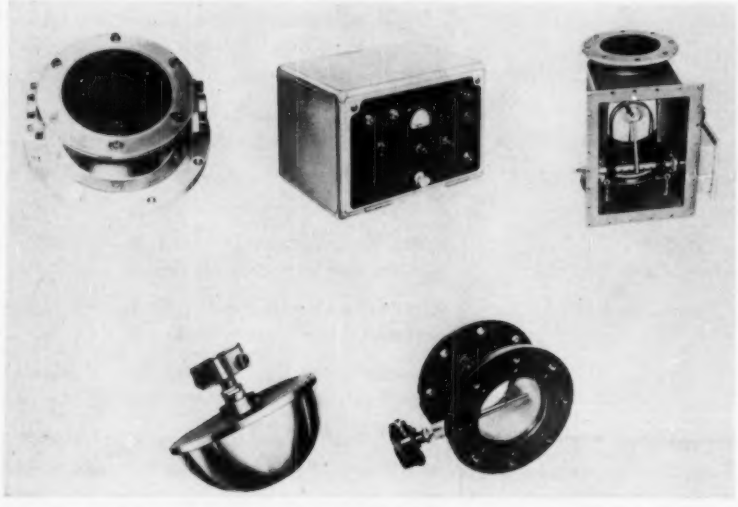


Fig. 7 Standard components of an explosion protection system. Shown at top from left to right: a pressure-sensitive explosion detector, special power unit with standby batteries and a high-speed isolation valve. Down at bottom: hemispherical suppressor and explosively-actuated vent. Not shown: surveillance or radiation detector and high-rate discharge bottle.

causes were certainly explosively triggered. Indeed, some experts estimate that 40 percent of the total loss results from explosions.

Nearly all current efforts to reduce these losses are passive, aimed at preventing explosions or controlling them, thus reducing but not eliminating loss. Most of such efforts depend upon fallible human factors. A recent survey in the power generation field showed human failure to have contributed to 90 percent of the explosions occurring in a recent year.*

Considering these factors, the manufacturer's engineers believe that this completely automatic system for active protection against explosions offers American and Canadian industry an opportunity to

* "Power," McGraw-Hill Publishing Co.; Vol. 103, No. 6; June 1959; p. 237.

eliminate losses and casualties from this source.

How the System Works

System operation is based upon the fact that, although a blast appears instantaneous to the naked eye, **there is a finite lapse in time between its ignition and the build-up of destructive pressures.** The protection system acts within this period, which is measured in thousandths of a second. (The human eye cannot react to periods shorter than 0.1 second.) In a few milliseconds the system detects the very beginning of the explosion, either by sensing the initial pressure build-up or the first tiny flash of flame, and automatically reacts to snuff it out. The blast is made harmless by a combination of actions, which may include any of the following:

1. Suppression—envelopment of the explosion with a suppressant.
2. Venting—opening a path to the atmosphere for controlled relief of pressure.
3. Advance inerting—introducing a suppressant into areas remote from the source of the explosion to prevent secondary explosions or fires.
4. Isolation—blocking the explosion from other areas.
5. Automatic plant or equipment shutdowns.

Figure 2 shows the basic suppression system and a graphical comparison of pressure build-up vs. time of a normal blast, and one which has been automatically suppressed.

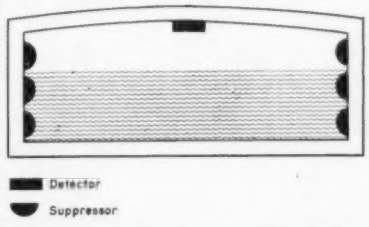
System Thoroughly Tested

Since 1956, the American manufacturer has been testing the system at a secluded test site near Framingham, Massachusetts. The test center is believed to be the only one of its kind in the United States. Work there has been performed under both the manufacturer's and private company sponsorship.

Primary research objective has been to investigate the explosion characteristics of various explosive materials. The important conditions of practical explosion prob-

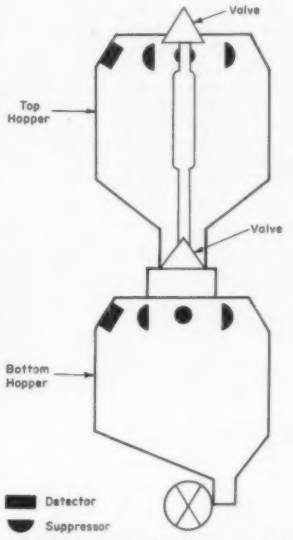
Applications of Explosion Suppression Systems

PROTECTION OF FLAMMABLE LIQUID STORAGE TANK BY SUPPRESSION



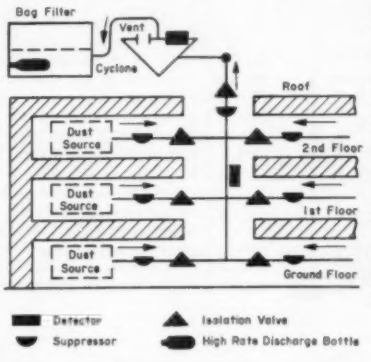
Although the petroleum refining industry is the most obvious one, many industries store flammable liquids. The protection system represented above is designed to prevent the walls of the tanks from being burst by an explosion. It is possible to give protection for any level of liquid fill by mounting several hemispherical suppressors on the inner walls of the tank.

PROTECTION OF PULVERIZED FUEL PLANT BY SUPPRESSION



Pulverized fuel plants are widely used in public utility electric generating stations and in industrial power plants of all types. In the system shown here, the bottom hopper operates at pressures considerably above atmospheric and feeds fuel into a system under pressure. The top hopper receives the pulverized fuel by gravity. After filling, it is closed and pressurized to feed fuel into the bottom hopper. Danger of ignition due to tramp iron, flint, etc., exists at the inlet and outlet valves. Therefore both hoppers are protected by a ring of hemispherical suppressors containing a suitable suppressant.

PROTECTION OF PLASTICS PLANT DUST EXTRACTION SYSTEM BY ISOLATION



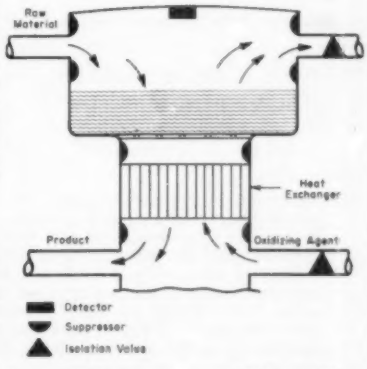
Many industries are concerned with the extraction of flammable dust. Among them are the plastics industry, the feed and grain industry, milling, and metalworking. This schematic shows a dust extraction system used in the manufacture of plastics. Dust is removed from a number of subsidiary ducts serving several floors to a main vertical duct, and is finally collected by a cyclone and a bag filter.

The protection system is arranged so that in the event of an explosion at any point in the plant, the dust sources will be isolated from the main duct, the cyclone, and the bag filter. This insures that no secondary explosion will occur at any point in the plant due to an explosion at some other point.

Isolation is accomplished by high-speed isolation valves, activated by explosion detectors located in the cyclone or vertical duct. A hemispherical suppressor is fitted adjacent to each valve to extinguish any flame or burning material which might pass through before the valve closes.

(Applications continued on next page)

PROTECTION OF CHEMICAL REACTOR BY ADVANCED ISOLATION AND SUPPRESSION



An oxydizing agent combining with a raw material in a chemical reactor produces a severe explosion hazard. The system shown suppresses the explosion in the main chamber and prevents the spread of the explosion into the adjacent areas of the plant by the rapid closing of high-speed isolation valves. It is also possible to similarly protect against over-pressure from uncontrolled reactions.

APPLICATIONS OF EXPLOSION SUPPRESSION SYSTEMS

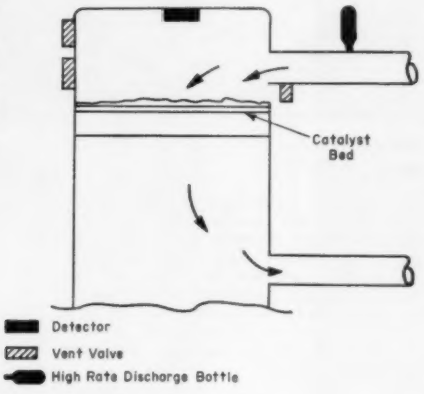
lems, such as temperature and pressure and volume, are duplicated in special explosion chambers (Figure 3). High-speed electronic instruments (Figure 4) record such information as temperature and pressure build-up with reference to time, of both uninhibited and suppressed blasts.

Sequential still photographs (Figures 5 and 6) taken from high-speed motion picture studies of actual explosions at the test center, give graphic evidence of suppression effectiveness. Both are explosions of Stochiometric mixtures (ideal burning conditions) of propane and air ignited by an electric spark. Contrast the build-up of the fireball of the unsuppressed blast (Figure 5) with its suppression in Figure 6.

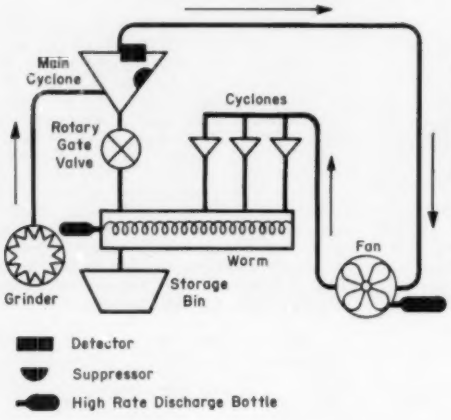
(Continued on page 54)

An explosion hazard is produced in a chemical convertor by the pressure of a hot catalyst bed and a combustible product. Here the main convertor is vented by the use of explosively operated vents to relieve the pressure build-up resulting from an explosion. The spread of the flame front is prevented by an actuation of high speed isolation valve.

PROTECTION OF CHEMICAL CONVERTER BY VENTING AND ADVANCE INERTING



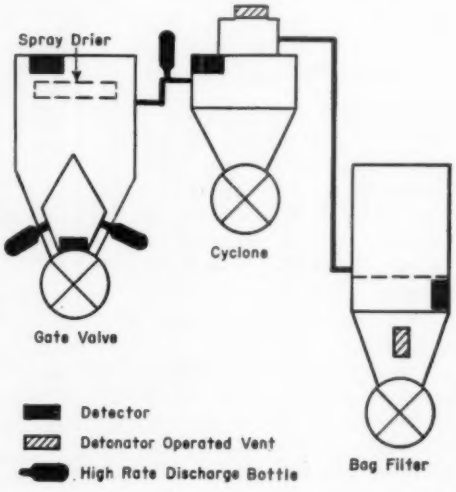
PROTECTION OF WOOD FLOUR MILLING PLANT BY ADVANCE INERTING



An explosion protection system in a wood flour milling plant is generally applicable to all types of milling. This system is an example of advance inerting and partial suppression. An explosion in the main cyclone is partially suppressed. The storage bin and small cyclones are advance inerted to avoid secondary explosions or fires. Partial suppression of the explosion in the main cyclone is accomplished by a hemispherical suppressor. With additional relief from a high-speed vent, this section of the plant is fully protected.

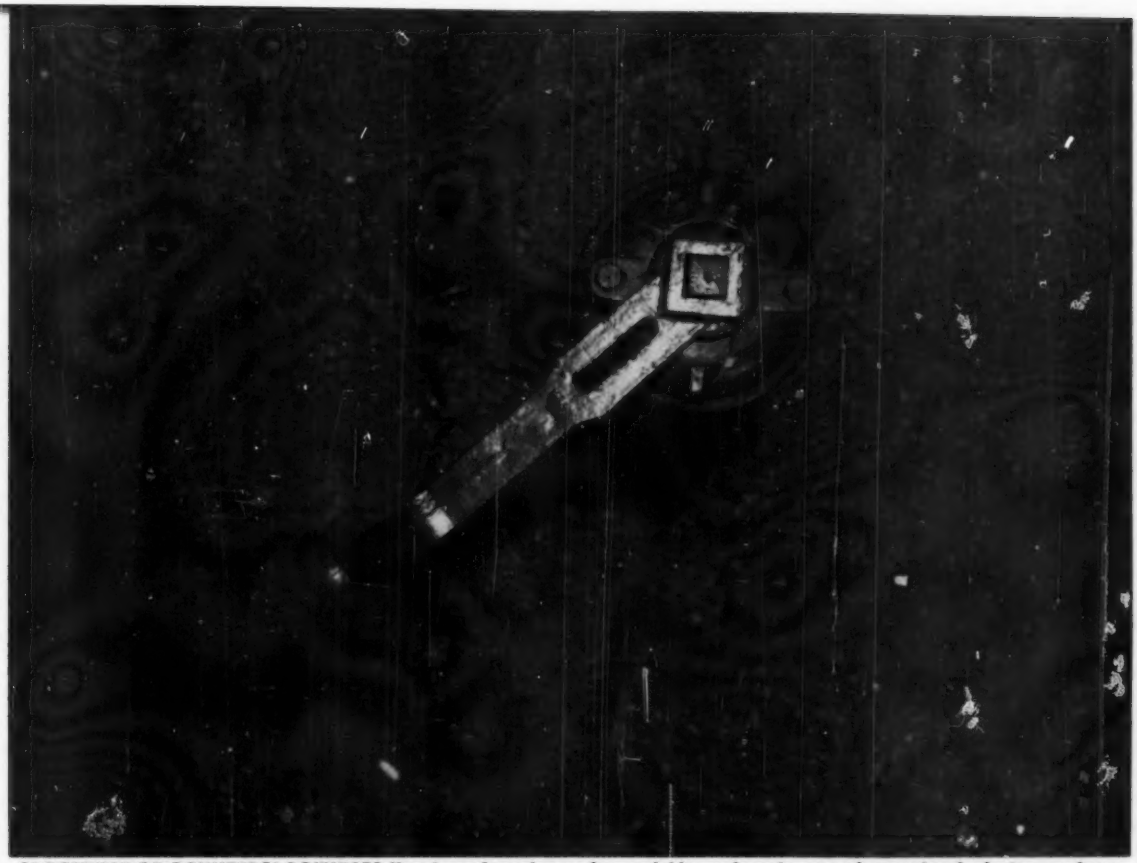
A high rate discharge bottle located in the worm casing directly below the rotary gate valve extinguishes any smoldering material which might be carried through from the cyclone. Another high-rate discharge bottle located at the fan inlet extinguishes burning material entering the fan circuit, eliminating the cause of secondary explosions in the small cyclone.

PROTECTION OF SPRAY DRIERS BY SUPPRESSION AND VENTING



Spray driers are widely used in the feed and grain industry, in the production of starch and plastics, and in a number of chemical processing operations. In such a process, the most likely source of ignition is at the gate valve located at the bottom of the powder collecting ducts. These ducts are protected by high-rate discharge bottles so that in the event of an explosion originating at the gate valve there would be little possibility of flame spreading to the drier chamber. In any case, a dangerous rise of pressure would be prevented by the bursting of the detonator operated vent.

To protect the drier chamber from flame resulting from an explosion in the cyclone, an additional high-rate discharge bottle inerts the interconnecting ducting. The cyclone and bag filter are also protected by detonator operated vents. Operation of the equipment can be initiated by any one of the three explosion detectors.



CLOCKWISE OR COUNTERCLOCKWISE? Usual, preferred way for sprinkler valves to open is counterclockwise, as here.

Turn to Uniformity in Sprinkler Valves

In nearly all industrial properties, the indicator-post valves controlling sprinkler systems turn in a counterclockwise direction to open.

In a very few properties, all the valves open in a clockwise direction.

And in come properties, some of the valves open one way and some the other.

Which way a sprinkler-control valve turns to open can be extremely important. Unless it opens in the same direction as all other sprinkler valves on the same property, confusion is almost inevitable.

Where valves do not all open in the same direction, confusion is almost certain to result. The men who supervise the valves or anyone checking a valve in case of fire can easily mistake the way a particular valve operates. A valve thought to be open may actually be shut, with fire protection useless.

The destruction of a multimillion-dollar plant a few years ago was directly attributable to such confusion. Fourteen of the valves opened one way and six the other. In the early stages of a fire, a man went to make sure that the valve controlling the fire area was open. It is perhaps not surprising that in the excitement he mistook the direction-to-open and shut the valve instead. With sprinklers deprived of water, destruction followed quickly.

Similar confusion resulted at another plant. A clockwise-opening valve was left shut after being closed for repairs because it was thought to open counterclockwise as did all others at the plant. A maintenance man even repainted the arrow and readjusted the target to read "open" when the valve was actually shut. It remained so until found by a Factory Mutual engineer and left open, fortunately before any fire occurred.

Another instance came to light during water flow tests. When no water was obtained through a public water connection, the city valve was found shut. A water-department employee had operated the valve six months before. He tried to prove it was open by showing that his wrench would not turn any farther counterclockwise. Turning it clockwise opened the valve, and a normal flow was then obtained through the connection.

Counterclockwise is the usual and preferred way for sprinkler-control valves to open. Valves of this type should be specified at new plants and for additional installations at existing plants. The only exception: where all or nearly all valves already installed open clockwise. Failure to specify is the reason for the undesirable situation at

(Continued on page 38)

some plants that now have both types of valves.

If some of your valves open clockwise, and if replacement is impractical, make especially sure that each valve is conspicuously marked with an arrow showing the direction to open. Marking is of course desirable for all indicator-post valves, whatever the direction to open.

By courtesy of Factory Mutual Engineering Division.

Electrical Safety In Steel Plants

Safety and electricity are relatively new to industry: electricity had its first practical application in the nineteenth century; safety engineering came into its own in our present twentieth century. The engineering improvements made by the manufacturers of electrical equipment and the continuing efforts of industry to provide safe working conditions for employees are now well recognized. The observations were made by J. F. Trenner, Asst. Superintendent Electrical Dept., Bethlehem Steel Co., Sparrows Point, Md., at the recent Iron and Steel Convention.

The safety program now being followed for steel plant electrical men was discussed by the speaker. Points that received attention in his paper were: (1) use of the electrical department safety code by all employees; (2) the practice of stand-up safety meetings and their importance; (3) the composition and use of the job safety analysis for recording and recognizing steps to be taken and hazards observed in performing certain jobs; (4) "fresh" monthly material provided for conducting a live safety meeting; (5) training for new hourly employees with emphasis on safety; (6) supervisor training courses; (7) the personal protective equipment program; (8) provision for cause coding of accidents and their analysis to pin-point hazards in certain areas or among groups; (9) the cost of accidents; and (10) the emphasis placed on housekeeping.

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NFPA Fall Meeting

Several hundred fire safety experts from the United States and Canada will meet in Columbus, Ohio, at the forthcoming annual Fall Conference of the National Fire Protection Association. The conference, to be held November 14–16 at the Deshler Hilton Hotel, will cover topics ranging from school and hospital fire safety to industrial protection and disaster planning.

One session will be devoted to such fire department questions as equipment developments, manpower problems and public education techniques.

Will Open Conference

Officials of the international nonprofit fire safety organization, including Loren S. Bush of San Francisco, president, and T. Seddon Duke of Philadelphia, board chairman, will open the conference with a report on trends in fire protection.

NFPA General Manager Percy Bugbee will describe current action to meet the problem of heavy annual losses of lives and property in fires.

Morning and afternoon sessions of the three-day conference, which is open to both members and nonmembers of the association, will treat a wide variety of other subjects in the fire prevention and protection fields. Among them will be fire and electrical safety in mobile homes and trailer camps, organizing industrial fire protection, flammable liquid storage and handling, rural fire protection, lumberyard fire problems, mutual aid plans and the production and transportation of flammable gases.

Handling Arrangements

Arrangements for the conference are being handled by a sponsoring committee made up of Ohio members of the National Fire Protection Association. Chairman is Carl J. Setzer of the Ohio Inspection Bureau of Columbus, with Ohio State Fire Marshall Wilson M. McLaughlin serving as co-chairman.

Learning The Hard Way

PORTABLE GRINDER

A foundry worker was preparing to grind a casting with a portable grinder. Without telling anyone, he substituted a thin, high-speed cutting disk for the thick abrasive wheel for which the grinder was designed. The hole on the disk was considerably larger than the spindle. As soon as the rotating disk touched the casting, the disk burst into fragments, one of which injured another nearby worker. People using grinders of any kind must be thoroughly trained in the safety rules covering working speeds, mounting, suitability for the job, etc.

BROKEN GLASS

One of the major causes of injuries among restaurant and hotel employees is broken glass. A typical example involved a waiter who broke a tumbler but carried it on a loaded tray to the dish-washing area. The operator of the glassware washing machine grasped the broken glass without looking at it and severely injured his hand. Employees must have careful safety training to keep them alert to the hazards of broken glass. Also special receptacles should be provided for broken glass and a specific routine established for disposing of it, either by the person who breaks it or by affixing a red tag to it for disposal by the washing machine operator.

OLD HAND MINUS A FINGER

It isn't just the "green" hand that makes safety mistakes. The old hand too takes foolish chances. An experienced lathe operator was making a cut on a steel shaft. The steel shavings had collected around the point of operation. Instead of taking the extra time to reach for a chip tool, the operator picked up a wrench that was handy and tried to pry off the chips while the chuck was still turning. His index finger was caught between the rotating shaft and the cutting tool and was amputated.

SPRINGING THE STRAP

An employee was unpacking a load of stock. Having cut the steel binding strap, he was trying to pull it away from the skid. The strap caught under the skid and coiled. When it released, it struck the man in the eye. Safety glasses should always be worn when handling steel strapping. In this case, too, the employee should have cut the strap when it caught instead of trying to pull it free.

EYE BURN

An employee was preparing to steam-clean some equipment and was adding scoops of a strong powdered detergent to the reservoir. A particle of the detergent was either blown or splashed into his eye, which received a severe chemical burn. Extreme care must be exercised in the handling of concentrated detergents. The employee should have worn chemical goggles. Also eye-wash fountains should be provided wherever dangerous chemicals are used, for the best first aid treatment for chemical eye burns is immediate liquid flushing of the eye area.

NO WARNING

An employee was cleaning some accumulated material from the drive pulley of a centrifuge conveyor in a chemical plant. He had turned off the centrifuge switch, but suddenly the conveyor started and the employee's arm was seriously injured when it was pulled between the pulley and the belt. The employee had failed to lock out and tag the control switch when he started work. The centrifuge operator, not realizing that anyone was working on the equipment, started to operate the equipment. This type of accident is common in all kinds of industries and can be prevented only by proper lockout and tagging procedures.

Not Riding for Fall
(from page 13)

of the kitchen ranges. This was one of the first applications where abrasive was used. Because the area had to be mopped frequently, a 70 grit abrasive was selected. Coarse enough to provide safety, the grit is fine enough so that it doesn't catch threads from the mop, making the area easy to keep clean.

Other suggested areas where the resin-abrasive surface will reduce slipping hazards include steps, building entrances, factory floors and aisles, ladders, sidewalks and platforms. The coating also has application in highway construction on danger spots such as bridges, ramps, toll booths and the like.

This non-slip resin-abrasive combination is especially suited for installation in schools, hospitals, stores, industrial plants, churches, public buildings and private construction.

Both the aluminum oxide and silicon carbide abrasive particles are available in a wide variety of grit sizes. In resurfacing operations utilizing resin binders, the second resin coating locks in the grit particles. Therefore the smaller grit sizes, such as 46, 60 or 70, are commonly used for this type of non-slip application.

Abrasive particles are also used as aggregate for non-slip permanent flooring. When the abrasive grit is installed in concrete, from 75 to 90 percent of each particle must be below the surface to make a good bond. To give a larger exposure of abrasive-grit at the surface, larger grit sizes are used. Grains as large as size 8 have been used and sizes 12 to 16 are common in this type of application.

Pictures by courtesy of the Norton Co.

Conferences On Building Research

Featuring a research correlation conference on "Preassembled Components" in modern building, the Building Research Institute will stage its 1960 Fall Conferences at the Shoreham Hotel, Washington, D. C., November 15–17. Developed under the chairmanship of Leon Chatelain, Jr., the three-day session will also include a conference on "Structural Foams," a conference-workshop on "Fasteners and Anchorage Devices for Industrial Curtain Walls," and a conference on Building Research developed by the Institute's Research Committee.

The program on preassembled components, which has been under development for the past year by the BRI Plastics Study Group, will first examine the attitudes toward this method of construction held by architects, home builders, general and specialty contractors, building owners and operators, organized and unorganized labor and building code officials. A spokesman for each of these groups will present the views of his colleagues, their problems and successes with the use of components, and their suggestions for further improvement of methods, materials and

(Continued on page 47)

REPAIR FLOOR CRACKS
with new plastic material

A new plastic material, formulated for the specific purpose of repairing floor cracks and preventing surface deterioration, is announced by The Monroe Company, Inc., Cleveland. Known as "Jiffy Floor", it is a fine granular, ready-to-use plastic product that can be applied without interfering with production or traffic. It readily fills hairline cracks, shallow holes, spalled floors or expansion joints. Immediately after application, it will withstand heaviest loads.

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Jiffy Floor contains no asphalt, cement, sand or gravel. It will not crack, crumble or curl . . . is not affected by temperature changes . . . can be applied indoors or out.

Jiffy Floor is waterproof, dustless, skid-proof and noiseless. Available in 5-10-30 and 55-gallon drums, ready for easy use. For further information, write The Monroe Company, Inc., 10702 Quebec Avenue, Cleveland 6, Ohio.

(For details, use Key # Y-7 on card on page 1)

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(For details, use Key # Y-8 on card on page 1)

industrial hygiene

Health Physics Courses for State Government Personnel

The Atomic Energy Commission will offer intensive courses in health physics for representatives of state and local governments as a step in encouraging the states to assume control of certain radioactive materials under an amendment to the Atomic Energy Act, passed in September, 1959.

This instruction will provide work experience for persons who will be concerned with licensing and inspection functions in their states.

The Commission's Health and Safety Laboratory in New York began a 10-week course in health physics on October 17, and will repeat the course in February of 1961. Argonne National Laboratory, Argonne, Illinois, expects to offer the course early in 1961.

Similar instruction will be provided at Oak Ridge, Tennessee. Oak Ridge Institute of Nuclear Studies will offer a four-week course on radioisotope techniques starting January 9, 1961, and again on March 6, 1961. This will be followed by a six-week course in health physics at Oak Ridge National Laboratory beginning April 4, 1961.

Degree or Equivalent Needed

There is no charge to the states for the courses, but persons attending, or their states, must pay the trainees' living expenses. Applicants should have a bachelor's degree in science or engineering, or its equivalent.

Coordination work for the courses is being done by the State-AEC Relations Branch, Office of Health and Safety, U. S. Atomic Energy Commission, Washington 25, D. C.

The AEC plans to make these health physics courses available in other parts of the country at a later date.

The Commission provides two other types of instruction for state personnel. They are:

(1) A one-year course in radiation control consisting of an academic year at the University of Michigan or Harvard University followed by three months on-the-job training in AEC facilities. The Commission pays tuition and all laboratory fees for students accepted for this course. Applicants should have a bachelor's degree with adequate preparation in science, preferably with mathematics, through calculus. However, majors in public health who may not fully meet these academic criteria will be considered.

Other Programs Offered

(2) On-the-job orientation and work experience in the AEC licensing and regulation programs also are offered by the Commission to representatives of states planning assumption of the regulatory responsibility for the specified radioactive materials. This consists of two areas of instruction. The first is a period of two to three weeks of orientation of key administrative personnel of state regulatory authorities with AEC licensing, inspection and compliance functions, both at AEC Headquarters at Germantown, Maryland, and at an AEC Operations Office. The second area is on-the-job experience for technically qualified personnel for four to eight weeks in licensing functions at AEC Headquarters and in inspection functions at an AEC Operations Office.

Further information about the health physics courses may be obtained at Argonne National Laboratory, Argonne, Illinois; Atomic Energy Commission Health and Safety Laboratory, 376 Hudson Street, New York 14, N. Y.; Oak Ridge Institute of Nuclear Studies and the Oak Ridge National Laboratory, both at Oak Ridge, Tennessee; or from the State-AEC Relations Branch, Office of Health and Safety, U. S. Atomic Energy Commission, Washington 25, D. C.

Will Furnish Information

Information about the courses at the University of Michigan and Harvard University can be obtained from Oak Ridge Institute of Nuclear Studies, Oak Ridge, Tennessee, or from the Commission's Office of Health and Safety, Washington 25, D. C.

Arrangements for on-the-job orientation and training may be made through the State-AEC Relations Branch, Office of Health and Safety, U. S. Atomic Energy Commission, Washington 25, D. C.

Rescue & First Aid Meeting

Two international contests are among the features of the 13th Annual Convention of the International Rescue and First Aid Association being held at the Benjamin Franklin Hotel, Philadelphia, Pa., Nov. 3, 4 and 5, 1960. The Pennsylvania Association of First Aid and Rescue Squads is host to the convention.

Teams representing IRFAA member units and associations from various sections of the United States and Canada are competing in the IRFAA's annual International First Aid Contest and first annual International Rescue Contest.

The Philadelphia Automobile Trade Association is providing the trophies for the first five place teams in the International First Aid Contest according to announcement by PATA President Charles A. Bott, Philadelphia.

The Air Line Pilots Association and the Air Line Dispatchers Association, both international organizations, are jointly offering the trophies for the championship and next four place teams in the International Rescue Contest, according to announcements by ALPA President Clarence N. Sayen, Chicago, and ALDA President R. E. Commerce, Arlington, Va.

Workshops and panel discussions of new developments and techniques in specialized first aid, rescue, fire, poison emergencies and addresses by Col. C. L. Smith, Commandant, Canadian Civil Defence College, Arnprior, Ontario, Canada, and other dignitaries, and the annual election of officers are among the program features.

Research on Radioactive Industrial Water

The formation of a new Subcommittee on "Methods of Radiochemical Analysis," was announced by Committee D-19 on Industrial Water during the 63rd Annual Meeting of the American Society For Testing Materials. The scope of this new subcommittee covers the preparation of methods for the physical and chemical testing of industrial water, industrial waste water, and deposits where radioactivity or radiochemical considerations are controlling. Committee D-19 has had three task groups actively engaged in the preparation of methods relating to radioactivity in water. To better serve this important area, the new subcommittee will be devoted specifically to such work. This action in addition gives a more authoritative voice to those whose specialty is radiochemical methods.

The new subcommittee presently contains task groups on methods of measurement of radioactivity in water, radiochemical analysis for radiostrontium in water, and reactor cooling water contamination. In addition to these task groups, other task groups engaged in radioactivity problems will continue their work under other subcommittees. These latter task groups are: Sampling Radioactive Industrial Water, Specifications for Heavy Water, and Bibliography on Radioactivity in Industrial Water.

It is hoped by Committee D-19 that the new subcommittee will provide an organization where interested and qualified people can solve their mutual standardization problems on radioactivity in water.

The acceptance of a new method of test for operating performance of sodium-cycle cation-exchange materials for removal of calcium and magnesium ions from industrial water was reported. It represents the first published standard from this relatively new area.

New projects initiated or reported on for the first time included the preparation of purchase specifications (and related test methods) for heavy water, work on the determination of additional elements (chlorides, nickle, aluminum, and zinc) in high-purity water, and the organization of a new subcommittee on methods of radiochemical analysis.

The committee-sponsored research project for vaporous carryover in boilers was reported to be nearing completion. Results will soon be available for study, and it is contemplated that a detailed report on the project will be ready for presentation as part of a symposium on steam impurities, which the committee is planning to sponsor at the 1961 Annual Meeting.

Officers of the Committee re-elected for 2-year terms were: Max Hecht, Philadelphia, as Chairman; and Orrin M. Elliott, Sun Oil Co., Philadelphia, as Secretary.

Air Pollution Manual

The American Industrial Hygiene Association has published a 200-page book entitled, "Air Pollution Manual—Part 1: Evaluation." Designed for industrial hygienists, air pollution control engineers, plant engineers, public health authorities, etc., the book discusses in readily understandable language the procedures for evaluating air pollution. The material was prepared by leading authorities in the field.

Included in the volume are chapters on: Community Relations, Legal Aspects, Concentrations of Pollutants in Various Cities, Biological Effects, Effects on Plants and Animals, Effects on Economy, Community Sampling, Stack Sampling, Chemical Procedures, Odors, Radioactive Substances, Meteorology.

Copies of the manual are available to members of the Association at $5.50 and to non-members at $8.50 from: American Industrial Hygiene Association, 14125 Prevost, Detroit 27, Mich.

Benzoyl Peroxide Safety Data

The newest in the series of safety data sheets, SD-81, Benzoyl Peroxide, has been published by the Manufacturing Chemists' Association.

Benzoyl peroxide is a white granular solid used largely as a catalyst in resin manufacture. Classified by Interstate Commerce Commission as an oxidizing material, it is highly flammable and will decompose explosively when heated in a confined space.

The new MCA safety data sheet covers properties, hazards, engineering control of hazards, employee safety, fire fighting, handling and storage, and waste disposal.

Copies of SD–81 are available at 30 cents each from the Manufacturing Chemists' Association, 1825 Connecticut Avenue, N. W., Washington 9, D. C.

Atmospheric Dust: What Is It?

by **JAMES W. MAY**, Technical Director
Air Filter Division
American Air Filter Co., Inc.
Louisville, Ky.

Atmospheric dust is our adversary in most air filter installations. We know it is there, but exactly what is it?

Atmospheric dust is in reality a rather complex mixture of matter of rather undesirable aspect. Its components will usually vary with the locality in question, the season of the year, the direction of the wind, the proximity of manufacturing plants, etc. A sample of atmospheric dust taken in any given locality will generally contain minute particles of materials which are common to that locality together with other components which may have had their origin at quite a distance but which have been dispersed by the wind or air currents.

Dust Has Many Organisms

In general, atmospheric dust consists of minute quantities of silica and clay; soot and smoke and other forms of free carbon; decayed animal and vegetable matter; metallic fragments; organic material in the form of lint, plant pollen, etc.; together with germs, mole spores, bacteria, and other types of microorganisms.

It is not very comforting to realize that our atmosphere actually represents an infinitely large plenum chamber into which is being constantly pumped pollutants from chimneys, incinerators, and all types of industrial plants and processes. We work and play in this ocean of air together with its attendant impurities so that it is only natural as a manufacturer of air filter equipment to emphasize the effectiveness of removal as one of the most important considerations. Certainly if we can eliminate a sizable amount of this dust burden, it will make our surroundings more comfortable and more pleasant from both a health as well as a housekeeping point of view.

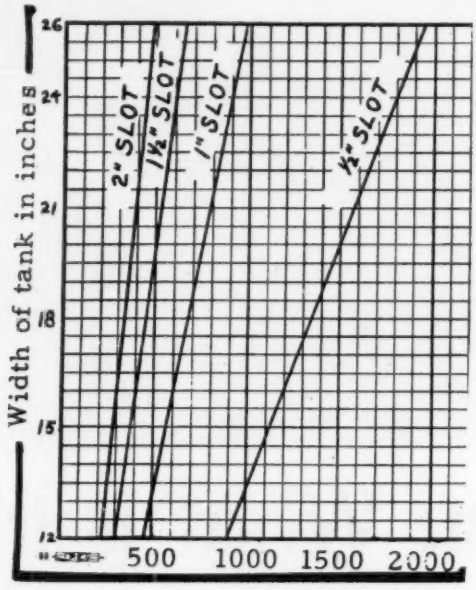
Among Worst Offenders

One of the worst offenders in atmospheric dust from the point of view of smudging or discoloring the interior of a filtered space is the free carbon component. Several years ago American Air Filter subsidized a research project at the University of Louisville, and they conducted a survey to determine the variation in the major constituents of atmospheric dust samples which were gathered from various sections of the United States.

The principal purpose of this investigation was to gain some factual information as to the amount of free carbon present in our atmosphere. In most published dust analyses, there is no distinction made between free carbon and combined carbon. Combined or total carbon would include virtually all organic

(Continued on page 46)

How to Control the Hazards



Graph 1 shows the velocities for slots ranging from one-half to two inches on tanks up to 26 inches wide.

by **ROMAN LESKO**
Chief Chemist
Industrial Hygiene Unit
Illinois Department of Labor

Degreasers are used in many operations in industry, and most of these are solvent degreasers of the open type. Before discussing the control measures to be used in and around open-type solvent degreasers, a brief description will be given of the different types of solvent vapor degreasers.

Vapor degreasing, a very popular method of removing grease from metal parts, consists essentially of a two-phase process: a liquid phase and a vapor phase. The most commonly used solvent is stabilized trichlorethylene, although perchlorethylene is sometimes used for special purposes. These solvents are heated to boiling in a suitable container, the upper portion of the container above the liquid level being cooled by means of coils through which cool water is circulated. The article to be degreased is immersed in the hot liquid phase to remove the largest portion of the greasy contaminants. The article is then brought into the hot vapor phase where the clean solvent vapor condenses on the relatively cooler article being degreased, thereby removing any grease still remaining.

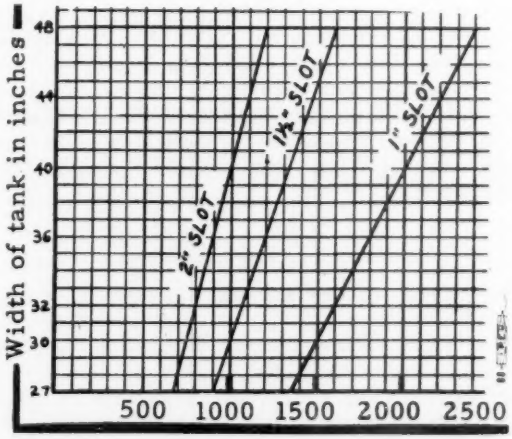
While most degreasing installations use both a liquid and vapor, or liquid and vapor sequence, there are others that employ vapor degreasing only and others where the liquid is sprayed over the surface being cleaned.

Five measures that are employed to control degreaser hazards in the use of toxic vapors to which workers may be exposed are described below.

Local Exhaust Ventilation

1. Ventilation must be adequate to remove, from the area of the worker's breathing zone, the vapors coming from the degreaser tanks as well as from the articles being degreased.

The generally accepted standards of hazard control by industrial hygiene engineers require that when an open-type degreaser is used, ventilation should be provided through lateral exhaust slots on the long sides of the tank.



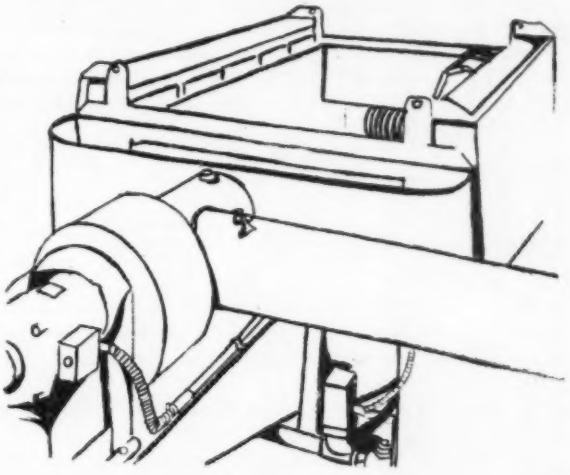
Graph 2 shows velocities for 1, 1½ and 2 inch slots on tanks more than 26, but less than 48 inches wide.

# of Open-Type Degreasers

If the tank is not over 26 inches wide, the exhaust should be sufficient to provide 75 cubic feet of air per minute per square foot of open tank surface. For example, if the degreaser tank is 2 feet by 3 feet, the required exhaust would be 450 cubic feet per minute, or a linear velocity through one-inch exhaust slots along both the long sides of 900 feet per minute.

If the tank is more than 26 inches wide but not more than 48 inches wide, the exhaust should be supplied at the rate of 100 cubic feet per minute per square foot of open tank surface. For a tank 3 feet by 5 feet, this would mean exhausting 1,500 cubic feet per minute, or a linear pull of 1,200 feet per minute through one and one-half inch slots along both long sides. The accompanying graphs show the linear velocities corresponding to the required volume of exhaust for open degreasers.

On tanks more than 48 inches wide, slot exhaust alone will not control the solvent vapors. These large degreasers must have supplementary control especially designed for the particular installation. For example, a down-drafted exhaust table could be used.



Open type tank degreaser, with lateral exhaust slots along long sides of tank to draw vapors into the exhaust system.

Location of Degreaser Tanks

2. Degreaser tanks should be placed in that part of the building where no cross drafts and interference from other exhaust systems could drive the vapors into the worker's breathing zone. Degreaser tanks should not be installed in close proximity to torches, gas heaters, and arc welding operations, because trichlorethylene vapors may decompose into deadly phosgene gas. Phosgene gas has a threshold limit of 1 part per million of air at which point it becomes dangerous for inhalation.

Maintenance of Degreaser Tanks

3. The degreaser tank and equipment should be checked periodically and records kept of its proper temperature operation and its clean-out condition. The effectiveness of the exhaust system in removing the vapors can be checked by sampling equipment, which determines how much vapor is getting into the air, or by a velometer, which measurers air velocity. The exhaust system is operating effectively if the concentration of vapor in the breathing zone of the worker is below 200 parts per million of air, the accepted threshold limit.

Personal Protection

4. The worker must exercise care in keeping his hands from coming in contact with the solvent. He should wear special gloves; otherwise dermatitis may develop.

Cleaning of Bath

5. Two workers should work together in cleaning out the bath. The worker inside the tank should be provided with an air-supplied respirator of a type approved by the U. S. Bureau of Mines. The worker outside the bath should be ready to remove the worker inside the tank in case the latter is overcome by vapor.

Proper instruction of workers is necessary in the use of control measures for degreasers. The worker must know how to work safely with degreasers, and why he needs to work in certain ways in order for protective measure to be effective.

ATMOSPHERE DUST

(from page 43)

materials, but certainly such components as lint, pollen, etc., cannot be considered to have the soiling properties of free carbon.

Twenty-five different samples of dust from throughout the U.S. were analyzed, and the actual free carbon content of these samples ranged from less than 10% by weight in one sample to in excess of 50% in another. Ten of the samples ranged between 30% and 40%, and the average of the free carbon component of the atmospheric dust in all of the 25 samples which were analyzed was 32%. This is particularly significant because it shows that careful consideration must be given to those air filter applications where soiling or discoloration is to be avoided.

Pictures by courtesy of Mine Safety Appliances Co.

Emergency Planning

While every effort should be made to prevent accidents, accidents happen—employees are injured, warns a safety bulletin of the Institute of Scrap Iron and Steel, Inc.

If someone is injured, **who does what** for the injured man?

In cases of danger and strife, few persons conduct themselves in a normal manner; they either "go to pieces" or they display strength, courage, and wisdom they never knew they had. Unless there is a planned procedure and the men are trained in this procedure, it is most likely that people will panic, possibly doing the wrong thing, if anything at all.

Being prepared for an emergency of an accident is a management responsibility. Proper and immediate care for an injured person will prevent the injury from becoming more serious, and may save a life.

Here are some important steps to be taken:

1. **If a machine is involved, stop machine—shut off power.**
2. **If a victim is caught in a machine, in or under materials, release him as carefully as possible.**
3. **Check for broken bones or arterial bleeding.**
4. **Give required first aid.**
5. **If necessary, get him to a doctor or the hospital.**
6. **Notify the doctor or hospital by telephone.**
7. **If the injured man will be detained past his working hours or is seriously injured, notify his family.**

If these steps are to be followed calmly and correctly, all supervisors and workers must be well indoctrinated in what each is to do, assuming that the injured man cannot help himself. At each operation, who will stop the machine? Those assigned to this task should practice so there is no doubt as to how it is done. Check each machine and work area to determine what might happen and what steps would be required to rescue the victim if he should be caught.

In order that proper first aid will be given, several regular personnel should complete a course in first aid. This may be obtained through the local American Red Cross.

If the injured man must be taken to a doctor or hospital, what transportation is available? What is the shortest route? Are the telephone numbers of the doctor, hospital, and ambulance unit handy at all telephones?

If it is necessary to notify the injured man's family, someone from the yard should be assigned this unpleasant duty. This is such an important and delicate duty that top management should accept this chore.

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Health Insurance Bibliography

The 1960 edition of "A List Of Worthwhile Health Insurance Books" is now being distributed by the Health Insurance Institute, 488 Madison Ave., New York 22, N. Y.

The Institute said the 26-page booklet is being sent to member companies of the Health Insurance Association of America, other insurance companies, the insurance trade press, hospital and medical journals and bulletins, newspapers, national magazines, syndicated columnists, public, special and college libraries, labor unions, and other organizations.

The new publication lists a selection of books on health insurance currently available from commercial publishers or other sources, organizations with a relationship to health and the financing of medical care, and periodicals that cover health insurance.

The Institute said copies of the 1960 edition of "A List Of Worthwhile Health Insurance Books" were free upon request, and that it welcomed inquiries for information.

practices. Chairman of the conference will be Robert T. Holtz.

The second section of the program will deal with the principles of design and assembly of components for both residential and nonresidential construction, for prefabricated and site constructed houses. Experience and cost data developed in production, distribution and construction by building material dealers will be reported, as well as a review of manufacturers' experiences in combining materials to form preassembled components and the optimum level of preassembly of components for the most favorable manufacuring and distribution costs.

The conference on "Structural Foams," on Wednesday, November 16 will include a session on foamed inorganic materials, including glass, concrete and metals, followed by a session on foamed organic materials such as the polyurethanes and polystyrenes in their application to thin shell construction. Chairman for the program on structural foams will be Thomas E. Werkema, and speakers will be drawn from the formost of the nation's experts in the field.

The BRI Research Committee, under the chairmanship of Peter B. Gordon, will again present a group of the proposals for new building research projects by colleges, universities and private research labs which have excited so much interest at the last two BRI semi-annual conferences. In addition, the Committee has been soliciting and screening reports from research workers on new research under way or recently completed. This is the first time that research people have had the opportunity to take the stand at a BRI conference and describe their own research projects outside the scope of the comprehensive conferences, and open them to discussion and criticism by an audience.

"Fasteners for Industrial Curtain Walls" will be a conference-workshop type of program, with specialists participating in a closed workshop followed by an open meeting at which their conclusions will be reported. Under consideration will be definitions, terms and design criteria for industrial curtain wall fasteners, installation practices and fastening techniques, and specifications and standards, appearance and durability requirements. The session will be under the chairmanship of William Wyckoff, who is chairman of the BRI Planning Committee on Mechanical Fasteners in Building.

Open to the interested public as well as to BRI members and guests, the 3-day meeting is the third in the newly inaugurated series of BRI semi-annual, multi-subject conferences. The Institute, is a unit of the Division of Engineering and Industrial Research of the National Academy of Sciences–National Research Council. Information about registration or further details about the conferences may be obtained from Harold Horowitz, Assistant Director for Technical Programs, Building Research Institute, 2101 Constitution Avenue, Washington 25, D. C.

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(For details, use Key # Y-9 on card on page 1)

WINDOW TYPE KIT FOR RAPID INVENTORY

The addition of a C-Thru window in the cover of the Davis Emergency Equipment Co.'s first aid kit makes possible more effective and rapid inventory surveillance of first aid supplies. Contents of each individual carton are easily discernible, as the cartons also have C-Thru windows. The new kits are designed for hanging on the wall, and can be quickly removed for carrying to the required area. The company offers a comprehensive selection of dressings and treatments for cuts, burns and other injuries.

For details, use **Key # FA-1** on inquiry card on page 1.

MOUTH-TO-MOUTH RESUSCITATION TRAINING

A training unit which furnishes sanitary conditions, while providing practice in the mouth-to-mouth technique of artificial respiration, is available from Medical Supply Co. The new Breathe Life Trainer permits accurate simulation of all steps of rescue breathing with a study "victim." The unit consists of a plastic lung in chest position; leading to this is an air tube with plastic mouthpiece which is inserted into the "victim's" mouth as well as that of the person practicing the technique. It is so constructed that neither person is in contact with the other's breathing or mouth, yet allows the trainee to inflate the imitation lung and hear the other's exhalation, thus learning the proper force and frequency with which the rescue breath should be delivered.

For details, use **Key # FA-2** on inquiry card on page 1.

OXYGEN RESUSCITATOR

A portable emergency oxygen resuscitator, attachable to any type or size oxygen supply tank without the use of a wrench, the Oxy-Quik, has been announced by General Scientific Equipment Co. The low-cost unit, which weighs only two and a half pounds, includes a face mask, a rebreathing bag, two oxygen cylinders, carrying case, and an automatic pressure-reducing regulator and gauge, which permits control of oxygen flow at approximately six liters a minute throughout the twelve minute capacity of the tank. Adaptors available for use with commercial cylinders.

For details, use **Key # FA-3** on inquiry card on page 1.

FIRST AID DEVELOPMENTS

INHALATOR-ASPIRATOR

An economical oxygen-supplied rescue breather named the Samaritan is being manufactured by Globe Industries, Inc. The resuscitator-demand inhalator-aspirator, when used as an oxygen resuscitator, is not dependent on compressed oxygen as a source of

power to operate a mechanical resuscitator valve. The unit may be used for mouth-to-mask resuscitation after the oxygen cylinder is depleted and if a spare oxygen cylinder is not immediately available. Apparatus may be used with or without oxygen to aid people who are having difficulty in breathing caused by asthmatic attacks or other illnesses, or by the inhalation of irritating gases.

The Samaritan may be used as a demand inhalator for patients who have been resuscitated but must be continued on oxygen. Unit also includes an aspirator to remove fluids, vomitus and mucus from the mouth and upper throat. Weighs 26 pounds complete with fully charged cylinder.

For details, use **Key # FA-4** on inquiry card on page 1.

DISPOSABLE SPLINTS

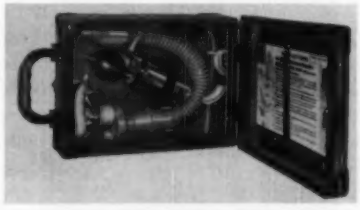
A new concept in emergency splinting has been developed by Hartmann Safety Products. Available in three sizes to accommodate arms, legs, hips or pelvis, the Hartmann Disposable Splint eliminates expensive replacement costs, requires no triangular bandages and enables one person to do the job. The splint is constructed of a special white corrugated board with attached muslin ties. It is tapered and scored to conform to the contour of the fractured limb and its construction permits x-ray of fractures without removal of the splint.

For details, use **Key #FA-5** on inquiry card on page 1.

EMERGENCY EYE FOUNTAIN

A first aid eye-washing fountain distributed by Daylite Vacuum Products Co. features a button on the rim of the fountain which is operated by pressure from the forehead. This releases two gentle streams of water to wash out acid, caustic or other harmful substance from the eyes. The hands are free to open eyelids forced shut by chemical irritation. The bowl is designed to fit the face and help assure effective cleansing of the eyes of all corrosive materials.

For details, use **Key # FA-6** on inquiry card on page 1.



HEAVY-DUTY CASE HOUSES MOUTH-TO-MASK UNIT

Their mouth-to-mask resuscitator is now offered by Globe Industries, Inc., in a fibre case designed to withstand rough handling on emergency vehicles and line trucks. The new case has edges and corners reinforced with metal and is fitted to protect and hold securely the resuscitator assembly, airway and aspirator. Equipped with sturdy carrying handle. Case may be wall or post mounted. Unit is approved by OCDM for purchase under the Federal Contributions program.

For details, use **Key # FA-7** on inquiry card on page 1.

FAST ACTION SPLINT

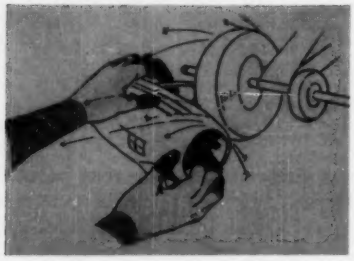
An emergency splint that an untrained attendant can apply to a fractured limb in thirty seconds is being manufactured by the Orthopedic Frame Co. In addition to its light weight, x-rays may be taken without removal of the splint. Replacing complicated splinting devices, which took at least fifteen minutes to arrange and required services of a trained attendant, the Stryker splint is calculated to reduce incidents of transportation injury to patients who are being taken to the hospitals. The new splint combines shaped aluminum half-sections with built-in padding and traction. It is fastened by three web straps to provide moderate, uniform compression to control bleeding and swelling. The corrosion resistant splints can be readily stored.

For details, use **Key # FA-8** on inquiry card on page 1.

MARINE FIRST AID KIT

A new first aid kit, offered by Forest City Products, Inc., has a firmly sealed plastic container which is watertight, unbreakable, rustproof and mildewproof, and it will float if dropped in water. Contents include adhesive strips, plastic strips, unguentine, merthiolate, absorbent cotton, scissors, first aid instructions and other items.

For details, use **Key # FA-9** on inquiry card on page 1.



WRIST & FINGER GUARDS

A special tape, Guard-Tex, has been designed by General Bandages, Inc., to provide protection for wrists in the handling of sheet metal and other sharp objects. It is disposable and can be thrown away after use. The company points out that the inner part of a man's wrist and forearm contain many superficial blood vessels and nerves due to a limited amount of fat, and a deep cut in this area may paralyze the fingers by severing the nerves. Supplied in regular and oil-resistant types, the product is also available for finger protection in such operations as transformer manufacturing, glass handling, etc.

For details, use **Key # FA-10** on inquiry card on page 1.

EMERGENCY BREATHING UNIT

A new resuscitator-inhalator-aspirator with a specially designed case resistant to abrasion, humidity, oil, grease and usual chemical sprays, is being manufactured by Ohio Chemical and Surgical Equipment Co. The case, which is free of sharp corners, has a one-piece metal bottom with full-length skid-runners, enabling it to slide easily on carpeted or hard floors, earth, pavement, etc. It opens flat for instant access to all working parts and, when space is cramped, or the victim hard to get at, the entire instrument panel lifts out for best positioning or easy carry by hand or as a back-pack with accessory straps.

The E & J Lytport II, 28½ lbs. including oxygen cylinder, features a compact resuscitator-inhalator instrument, the Micro, which "breathes" automatically for a patient, or on demand, as required. It adjusts automatically to victim's lung volume, and signals operator if mouth or throat blockage requires use of the suction aspirator. Secondary safety valves are set to open automatically before extra pressure from any cause, such as a patient's sudden cough or gasp, can reach harmful levels.

For details, use **Key # FA-11** on inquiry card on page 1.

1ST AID EYE-FACE FOUNTAIN

Latest development in Haws Emergency Eye and Face Wash fountains is the 7900 series, designed to blanket facial areas with cleansing water from all angles. The large stainless steel bowl contains a 360 ° spray ring, with six broad-coverage spray jets that bathe face and eyes, in case of accidental contamination by chemicals, caustics, fire or other matter. Jets are instantly activated when the large push valve is moved. Valve stays open until manually closed, leaving hands free to assist in first aid. Water coverage is over a 95 sq. in. area, and jets deliver eight to ten gallons per minute on ten lbs. flow pressure. All functional parts are corrosion resistant. Bowl is 22-gauge stainless steel. Wall and pedestal models are available.

For details, use **Key # FA-12** on inquiry card on page 1.

1ST AID PACKS FEATURE COMPLEMENTARY SUPPLIES

A new packaging idea developed by E. D. Bullard Co. makes it possible to stock twice the variety of first aid supplies in any kit. Less frequently used supplies can be purchased in combination with standard items to eliminate spoilage and waste. Conventional Unit Packs are split, allowing two types of supplies to be conveniently packed in one single pack. Supplies are combined to complement each other. The R-111 Split Pack contains a dressing (2″ x 2″ bandage compress) and two antiseptic units. Other Split-Packs include 2″ x 2″ gauze pads and hexachlorophene antiseptic soap in Unidrop tubes and burn ointment and ammonia inhalants. All are packaged in polyethylene for protection against dust and moisture.

For details, use **Key # FA-13** on inquiry card on page 1.

EMERGENCY OXYGEN UNITS

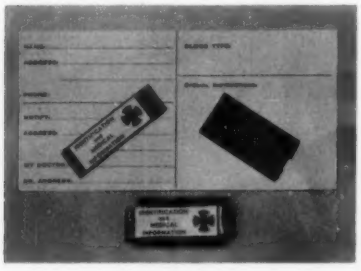
Portable oxygen units in three models ranging from 60 to 360 liters of oxygen at 1800 lbs. P.S.I. are available from General Air Products Corp. The units are easy to operate, requiring only that the adjustable plastic mask be placed over the face and the oxygen cylinder valve turned to open. An easily read gauge indicates the pressure in the tank at all times.

For details, use **Key # FA-14** on inquiry card on page 1.

GERMICIDAL PAIN RELIEVER

A combination pain reliever and infection preventative is being offered by Certified Laboratories. The product, Aid, is said to give instant relief from pain of scalds, abrasions and wounds, and to promote faster healing with minimal scarring through the use of a bactericide known as G-11 Hexachlorophene. The company reports that its product has also proved effective in the treatment of sunburn and dermatitis and the itching sensation common to both. Aid is packaged in aerosol form for efficient application, and can be washed off with plain water.

For details, use **Key # FA-15** on inquiry card on page 1.



MEDICAL INFORMATION CLIP

A new identification and medical information clip from the Walter H. McKenna Co. is intended for all who require prompt and proper medical attention should they become ill or injured, and particularly for diabetics, allergics, or cardiac patients. This safety device of stainless steel, measuring only 1½" by ½", clips directly to the wallet or purse, the most likely places a doctor or nurse would look for identification or medical information, and holds a bright red folder with a form which opens to 2½ by 5 inches. This form is printed with blanks for the name and address, phone, nearest relative, doctor's name and address, blood type, and special instructions.

For details, use **Key # FA-16** on inquiry card on page 1.

NEW EYE MEDICATION

A new non-prescription eye medication that incorporates all the properties of an eyewash plus medicinal action and an anti-bacterial agent is offered by the 20/20 Sales Corporation, Tulsa. Called 20/20, the product is reported to have been thoroughly tested in clinical tests by practicing physicians. It is a soothing antiseptic eye freshener that relaxes tired eyes and also reduces pain and discomfort caused by strain. If eyes become bloodshot from close work or over-exposure, such as arc-flash, 20/20's properties help clear bloodshot conditions by reducing enlarged blood vessels in the outer eye to normal size. This clearing action normally takes less than 90 seconds. Zinc sulphate in the formula successfully stops or retards 85% of the bacteria that cause most minor eye infections.

For details, use **Key # FA-17** on inquiry card on page 1.

NEW ORAL RESUSCITATOR

Mouth-to-mouth rescue breathing by untrained persons, without personal contact with the victim, is facilitated with the Venti-Breather resuscitator, manufactured by Venti-Breather Products, Inc. A flexible face mask separates the rescuer from the victim in a sanitary manner, and fits both adults and children. The rescuer breathes through a special tube to inflate the victim's lungs; as the victim's lungs deflate, a unique one-way valve directs his breath away from the rescuer's mouth and face. Nothing is

inserted in the throat of the victim to cause gagging or injury. For asphyxiation caused by drowning, heart attack, electric shock, suffocation, gas or smoke inhalation, etc.

For details, use **Key # FA-18** on inquiry card on page 1.

contaminants off **FAST!**

HAWS SAFETY SHOWERS send torrents of rushing water from all angles – washing away dangerous irritants in a hurry!

Slap open the conspicuous "Push to Operate" valve. Hard-running streams from 10 *adjustable* nozzles drench victims in seconds.

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(For details, use Key # Y-10 on card on page 1)

PORTABLE OXYGEN KIT

A low-cost portable oxygen kit, available from the Medical Division of The Burdett Oxygen Co., is simplified for easy operation by anyone. Emergency oxygen can be administered almost instantaneously simply by opening the cylinder valve, turning the flow adjustment knob, and placing the mask on the patient's face. Cylinder contains oxygen for approximately 40 minutes' use, enough time to permit arrival of additional oxygen or to take patient to doctor or hospital. In addition to its usefulness for victims of heart attacks, the 22 lb. unit can also be used to revive those suffering from shock, fainting spells, asthma, etc.

For details, use **Key # FA-19** on inquiry card on page 1.

VERSATILE AIR RESUSCITATOR

New resuscitation equipment comprised of a self-inflating bag, one-way valve and face mask utilizing atmospheric air, and a bellows-type foot pump, has been developed by Air-Shields, Inc. The breathing bag is lined with foam rubber which expands the bag and sucks in air through a one-way inlet. When bag is compressed, the valve automatically closes the exhalation opening, forcing air into the patient's lungs. Expired air escapes to the atmosphere when pressure on the bag is released.

The bag delivers volumes up to 700 cc with each squeeze. It is supplied for use with air only or with air and oxygen. The foot pump includes a plastic trap bottle. A spare overflow valve in stopper is an added safety measure. The pump will continue to work even if the suction bottle overflows. Valves are large enough to let secretions and blood pass through.

For details, use **Key # FA-20** on inquiry card on page 1.

ADJUSTING STRETCHER COT

A new elevating ambulance cot, developed by Ferno Mfg. Co., is claimed to be the first ever designed which can be used in a car with less than 35" headroom. Fingertip controls permit four different cot height adjustments from 31½" to 9½". At the lowest level, the recessed bed is only two inches from the floor. The Stretch'R-Cot features an easy operating backrest which is combined with the recessing bed. Side rails swing down so the bed lays out flat, permitting transfer of the patient by one man. Construction is of tubular aluminum, and the total cot weight is 44 lbs. Cot is equipped with foot-rest, folding foot pull handle and folding side arms. It fits all standard cot fasteners.

For details, use **Key # FA-21** on inquiry card on page 1.

MIDGET OXYGEN SET PROVIDES 1-HOUR SUPPLY

A four-inch round container, weighing 32 ounces, utilizes a new high strength steel to allow a controlled-flow oxygen supply of one hour. Manufactured by Breath-O-Life Oxygen, it is said to be a major advance in emergency oxygen administration equipment. Operation of the device is by facial contact with a plastic mask. Facial movements involved in the breathing pattern are converted into virtually automatic on-off signals for valve control of oxygen flow. Unit is reported to eliminate the 80% waste inherent in continuous-flow oxygen administration apparatus and, by virtue of its size, to make emergency oxygen available almost anywhere.

For details, use **Key # FA-22** on inquiry card on page 1.

NEW FIRST AID KITS

Two new first aid kits—the Kurvedge and the Aluma-Kit—have been designed by the A. E. Halperin Co. One of the primary improvements is the elimination of all sharp corners and edges. The Kurvedge Kit has leak-proof construction and rustproof zinc chromate undercoating. The Aluma-Kit is dustproof, waterproof and rustproof. It is also claimed to have high impact strength and tremendous rigidity.

For details, use **Key # FA-23** on inquiry card on page 1.

BACK PACK RESUSCITATOR

A new model Back Pack resuscitator, compact, light in weight and contained in its sturdy alumi-

num case, is offered by the National Cylinder Gas Division of Chemetron Corp. This model is easily strapped on the back by a rescuer and is more comfortable to carry. It makes it possible to reach trapped or injured victims seconds or minutes earlier, as the rescue worker has both hands free to crawl, climb ladders or remove debris.

The unit has dual outlets, permitting connection of a second resuscitator head and face mask so the bearer can also supply oxygen to himself when working in contaminated areas. Complete with its two oxygen cylinders it weighs less than 30 pounds. The Back Pack is used in three ways: as a resuscitator, inhaling and exhaling for a victim until his breathing is restored; as an inhalator, continuously supplying oxygen; and as an aspirator, removing obstructions from the throat. It is employed on victims of drowning, suffocation, heart failure, shock, gas poisoning and accidents.

For details, use **Key # FA-24** on inquiry card on page 1.

JUNKIN ELECTRO-LOCK SHIELD

MAXIMUM visibility... MAXIMUM protection!

The Junkin Electro-Lock Shield permits the operator to see clearly the work he is performing and at the same time protects him from severe injury or eye damage. Interlocking power and light circuits will not permit the machine to operate unless the shatter-proof Junkin Electro-Lock Shield is in complete protective position. This feature guards unthinking operators against mishap.

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(For details, use Key # Y-11 on card on page 1)

Building Planning

Industrial leaders concerned with building new plants or modernizing older facilities will get an unprecedented opportunity later in the year to hear how one of the world's leading companies solves these problems. The occasion will be the Industrial Building Exposition & Congress to be held at the New York Coliseum, Dec. 12 through 15.

A team of engineers of the E. I. du Pont de Nemours & Co., Inc., headed by M. F. Wood, the chief engineer, will comprise a panel on the topic, "Determining the Best Facility for a Company's Needs."

The du Pont construction organization, considered by many to be one of the most effective in the country, will describe the methods it used to get agreement on requirements from all executives involved in the construction of one facility.

A check list will cover five major areas:

1. Getting management to spell out its objectives from the standpoint of the product or service in the new facility and the flexibility and expansion required; which departments will be in the facility and the number of people involved; when it will be required, and where it is to be located.

2. The internal coordination required to assure that the project moves efficiently.

3. Getting departments to spell out their requirements; methods for reconciling differences, and getting each department's requirements on a more realistic basis.

4. Translating needs into cost estimates, size and quality of the facility and preliminary design.

5. Adjusting requirements to the best interests of over-all company needs.

This initial panel on determining the best facility will be followed by others with speakers from leading companies in many fields. Financing, modernization and expansion, plant location, working with community officials, employee services, use of prefabricated components, advances in the use of concrete, use of plastics in construction, flexibility, building small plants, controlling costs, construction problems in foreign countries, when companies should handle their own construction, developments in the use of steel and new applications of aluminum are among the topics.

Among the speakers will be executives of A.T. & T., R.C.A., I.B.M., General Electric, Westinghouse, Caterpillar Tractor, Ford Motor, Parke Davis, General Mills, Walter Kidde, General Foods, U.S. Army, Eberhard Faber, Jackson & Moreland, and Johnson and Johnson.

Exhibitors will include companies that supply building materials, sites and services, modernization materials, equipment and supplies to industry. Admission will be limited to corporate executives, architects, engineers and building contractors.

Advance registration cards and hotel information may be obtained by writing Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N. Y.

Explosion System

(from page 36)

Each explosion protection installation is unique, because it is tailored to meet the specific needs of the protected process or equipment. However, every installation consists of a combination of standard components (Figure 7).* Systems can also be designed to protect against fire and explosion hazards by combination with standard extinguishing methods. Such combined systems usually provide considerable savings over separate systems.

Detector Units

Heart of the system is the explosion detector. Either a pressure or radiation device, the detector senses the incipient explosion and, in conjunction with a power unit, generates an electrical signal. Pressure detectors are sensitive to either the rate-of-pressure-rise or to a specific static pressure, or to both. A signal occurs when the pressure rise from the incipient blast exceeds either setting, indicating an explosive condition. Radiation detectors are designed to selectively sense certain wave lengths of the spectrum which exist in an explosive flame but to reject others present in natural or artificial light, thus eliminating potential false alarms.

Upon receipt of a signal from a detector, the power unit, which is equipped with standy-by batteries for safeguard against power failure, delivers electrical energy to operate the various explosion protection devices in the system.

Protection Units

Protection devices may consist of suppressors, isolation valves or vents. For rapid actuation, all are operated by explosive detonators, similar to the precision electric blasting caps used in seismic exploration. It should be noted that the vents are not merely rupture discs blown out by the explosion itself but are opened before destructive explosion pressures occur. The time lapse between ignition of an incipient explosion and the operation of the various explosion protection devices is just a few thousandths of a second.

Suppressors may be easily ruptured hemispherical containers or high-rate discharge bottles. Both contain liquid suppressants. When activated, they dispense the liquid in fine particles moving at speeds up to 600 ft per second. The incipient explosion is cooled by heat of evaporation of the enveloping suppressant mist inhibiting further combustion. The most common suppressants used are water and chlorobromomethane. As an example of the quantities of suppressants required, only 5 cc of water or 2 cc of chlorobromethane can suppress an incipient explosion in a one gallon volume.

Essentially the vents are special glass windows which are fractured by an explosive detonator mounted against their outer face. Operation of the detonator fractures the glass, but the elevated pressure of the incipient explosion within insures that fragments will fly outwards, away from the protected space and process.

There are two types of swiftly acting isolation valves, butterfly and flap. They are held open, against heavy spring pressure, by a hollow metal link. Operation of an explosive detonator within the link breaks it, allowing the spring to slam the valve closed and hold it there.

A combination of protection devices is desirable to protect most processes.

Pictures by courtesy of Fenwal, Inc.

* The name of the American manufacturer of the explosion suppression system can be obtained upon inquiry to the Editor.

Winners of Vehicle Safety-Check Program

Great Falls, Montana, and Thermopolis-Hot Springs County, Wyoming, have been named Grand Award winners for conducting the most outstanding city and county Vehicle Safety-Check programs in the nation.

Teen-agers in Portland, Oregon, were selected to receive the 1960 "Circle of Safety" Grand Award for conducting the most outstanding teen-age sponsored Safety-Check. Coffeyville, Kansas, youngsters were named winners of the "Circle of Safety" Grand Award for outstanding assistance to a community or county Safety-Check.

The selections were made by a National Board of Judges, meeting in Washington, D. C., and climaxed the 1960 National Vehicle Safety-Check for communities program sponsored annually by the Auto Industries Highway Safety Committee and "Look" Magazine, with the cooperation of the Association of State and Provincial Safety Coordinators.

Additional Awards

National Awards of Excellence for exceptional city Safety-Check programs in their population groups went to: Smithfield, North Carolina; Logansport, Indiana; Anderson, Indiana; Tulsa, Oklahoma; and San Francisco, California.

Counties winning National Awards of Excellence by population groups were: Huntington County, Indiana; Madison County, Indiana; and a tie between San Diego County, California, and Summit County, Ohio.

In addition, 53 cities, 11 counties, and 10 teen-age groups were selected for awards within participating states.

The Judges also commended the United States Post Office Department, the state of Indiana, and three military installations—McClellan Air Force Base, California; Marine Corps Recruit Depot, Parris Island, South Carolina; and Lockbourne Air Force Base, Ohio—for submitting program entries for Safety-Checks in their areas, but for which there were no award categories.

All entries were judged and winners chosen on the basis of effective community efforts encouraging motorists to have their vehicles Safety-Checked for ten points affecting safe driving condition. The National Board of Judges considered the quality of the Safety-Check program, as shown in scrapbook entries submitted by the communities, as well as the total number of vehicles checked, rejected, and re-

checked in relation to the area's potential.

This seventh annual National Vehicle Safety-Check for Communities was conducted in most localities during May and June in states not requiring official motor vehicle inspection. "Join the Circle of Safety—Check Your Car—Check Your Driving—Check Accidents" is the slogan of the voluntary Safety-Check program which is designed to encourage community-wide efforts to promote traffic safety and to insure that vehicles are maintained in safe driving condition. The ten points checked which affect vehicle condition are brakes, headlights, tail lights, steering, tires, exhaust, glass, windshield wipers, mirrors, and horn.

New York's Annual Safety Conference

Appointment of the general chairman and two general vice-chairmen for New York's thirty-first annual Safety Convention and Exposition has been announced by the Greater New York Safety Council.

O. P. Peters has been named general chairman. The general vice-chairmen are Arthur F. Fuller and James F. Van Namee. The appointments were made by the convention interim committee, whose chairman is Robert M. Edmiston. The convention and exposition, which annually attract more than 8,000 safety experts and accident prevention workers to New York, will be held at the Statler Hilton Hotel April 10–14, 1961.

Mr. Peters is superintendent of the New York engineering department of the Employers Group of Insurance Companies.

Mr. Fuller is supervising engineer of the Aetna Insurance Group. Mr. Van Namee is division administrator of accident prevention of the Westinghouse Electric Corp., at Bloomfield, N. J.

Robert J. O'Donnell, manager of the Greater New York Safety Council, will be in charge of convention administration. William J. Farley will be convention director. Mr. Farley is director of the industrial division of the Greater New York Safety Council. The annual convention is sponsored by the Greater New York Safety Council with the cooperation of departments of the New York City government and of national and local official agencies and volunteer, business and professional organizations concerned with accident prevention.

Administrative Changes At Bureau of Standards

In recent months, many organizational changes have been made at the Washington laboratories of the National Bureau of Standards to streamline the Bureau's operations in order to meet the continually changing and increasing needs of modern science and technology.

At the Washington laboratories, a new division, Instrumentation, has been established. G. Franklin Montgomery is chief of the new division, which comprises three sections from the Electricity and Electronics Division (Engineering Electronics, Electron Devices, and Electronic Instrumentation), a part of the Mechanical Instruments Section from the Mechanics Division, and the Basic Instrumentation Section, which was formerly the NBS Office of Basic Instrumentation. Joshua Stern has been named chief of the Basic Instrumentation Section.

Instrumentation Division

The Instrumentation Division will investigate the fundamental properties and limitations of instruments, of their components and materials, and of measuring, recording, and signal-processing methods; investigate basic phenomena that may be usefully applied to instrumentation; develop improved instrumental techniques, instruments, and devices; provide scientific information and advice on instrumentation to other divisions of the Bureau, other Government agencies, and the public; develop specific instruments and systems for other divisions of the Bureau and, by special arrangement, for other Government agencies; provide calibration and repair services in certain instrument matters not included in the activities of other Bureau divisions.

Electricity Division

The remaining five sections of the old Electricity and Electronics Division, (Resistance and Reactance, Electrochemistry, Electrical Instruments, Magnetic Measurements, and Dielectrics) now make up the Electricity Division, with Dr. C. H. Page as Chief.

The duties of the Electricity Division will include establishment, maintenance, and dissemination of units and standards for measurements in electricity and magnetism; determination of fundamental constants of nature; basic research in the nature of dielectric and magnetic matter; calibration of standards and precision instruments for industry; testing electrical apparatus and supplies purchased by the Government; furnishing consulting service to Government agenices; devising new types of electrical apparatus.

Metrology Division

Another reorganized division, Metrology, has replaced the Optics and Metrology Division. A. G. McNish has been named chief of the new division, which contains all the sections of the old Division (Photometry and Colorimetry, Refractometry, Photographic Research, Length, and Engineering Metrology) plus the Mass and Scale Section and the Volumetry and Densimetry Section from the Mechanics Division.

As it is now constituted, the Metrology Division will be in charge of establishment, maintenance, and dissemination of units and standards of length, mass, volume, light (including ultraviolet and infrared), and color; conducting research, devising test methods, and making calibrations to make these standards more available for Government and public use; determination of fundamental properties of materials such as refractive index and thermal expansion; calibration and testing of length stand-

(Continued on page 58)

The U. S. Navy Aviation Supply Office, in Philadelphia, has been presented the Secretary of the Navy Award for Achievement in Safety for 1959. Rear Admiral Charles H. Lyman, USN, Commandant, 4th Naval District, presented the award to Captain John D. Sullivan, SC, USN, who accepted on behalf of ASO's Commanding Officer, Rear Admiral Joseph M. Lyle, SC, USN.

This is the highest safety award presented by the Navy to its establishments for exceptional accident prevention records. The accident rate for 1959 at the ASO was .6 disabling injuries per million man-hours worked.

This is the third consecutive year the Aviation Supply Office won this award.

John Dougherty, Safety Supt., explained, "In order for an activity to qualify for the award it must meet the frequency-of-accident standard, severity rate, and be scored on an appraisal of the extent and effectiveness of its safety program."

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Dr. Harold O. Wyckoff, Chief of the National Bureau of Standards' X-ray Section, has received a U. S. Department of Commerce Gold Medal for Exceptional Service. He was citied for "outstanding scientific research in the field of radiation shielding and measurements culminating in distinguished authorship of a book on radiation protection."

Dr. Wyckoff directs the Bureau's work investigations of electron and X-ray phenomena in the 10 kev to 3 Mev energy regions. Problems of current interest include measurement of the continuous X-ray spectra and polarization within this energy region, the determination of the conversion factors between ionization and absorbed dose, and the design of X-ray standards.

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Safety awards highlighted the three-day Annual session of the North Carolina Motor Carriers Association's Council of Safety & Personnel Supervisors. Thirty awards were presented by Col. Dave T. Lambeth, Commander, N. C. State Highway Patrol, Raleigh, and Rufus B. Jones, Trailmobile Inc., Cincinnati, Ohio.

The highest 1960 award, the "State Truck Safety Trophy," went to Burlington Industries, Inc., Transportation Division, of Burlington, N. C. It was selected on the basis of over-all safety on the highways, courtesy of drivers, personnel training, equipment and equipment maintenance, among other factors.

Other top winners were:

First runner-up plaque—Miller Motor Express, Inc., Charlotte, N. C.

Second runner-up plaque—Roadway Express, Inc., Winston-Salem, N. C.

Over-the-Road (all divisions) plaque—Petroleum Carrier Corporation of North Carolina, Inc., Wilmington, N. C.

Local (all divisions) plaque—The Transport Corporation, Durham, N. C.

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Supervisors of Cornell Paperboard Products Co. Container Division in Milwaukee, received recognition in the form of First Aid Kits for their part in completing one year without a single disabling injury throughout the entire Division of 330 employees. Close to a million accident-free man-hours were involved.

In presenting the first kit to Burt Mendlin, Production Manager, T. L. Seith, Vice President, Container Operations, cited the saving in pain, suffering and lost man-hours resulting from the accomplishment. W. E. Caldwell, Senior Vice President and Manager of the Milawaukee Operation and E. R. Haug, Safety Director observed the presentation.

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The American Optical Co. was presented a plaque recently for its part in sponsoring the 10th Round Table of Industrial Safety in Mexico City. The safety conference was sponsored by American Optical, its Mexican affiliate Arodem and the Mexican Association of Hygiene and Safety.

Charles C. Albrecht, manager of engineering services for American Optical's Safety Products Division, was principal speaker at the two-day conference which received world-wide attention. Mr. Albrecht is a member of the American Society of Safety Engineers and the Veterans of Safety. He spoke on "Eye Hazards and Protective Devices" and "Safety Clothing and Respiratory Protection."

Others who attended the conference and took part in the discussions were Mario Arango, Arodem's manager of sales, and Robert G. Baird, Arodem's general manager.

American Optical has a frame plant in Mexico City as well as sales and distribution offices for ophthalmic products and safety products.

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A new all-time safety record went into the books at Hanford in September as nearly 8,000 General Electric employees passed their ten-millionth man hour worked without a single disabling injury.

The new 10-million-hour safety milestone snaps the old Hanford mark of 9,437,000 hours without a lost-time accident set in 1954. The

record-breaking saftey performance began on January 12 this year.

At Hanford, the frequency rate for injuries stands at only .1 for 1960, compared to the national average for all industries of 6.47. Hanford recorded a single lost-time accident this year. If atomic workers had equalled the national average, for example, some 64 employees would have been injured for the period.

The injury severity rate at the atomic plant was 2.5 for 1960, contrasted to the national average of 754. At Hanford, 26 days were lost because of the one lost-time injury. Using the same comparison, General Electric employees would have lost 7,540 days if they had equalled the national lost-time average.

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The Secretary of Labor's "Award of Merit" was presented recently to Cyril Ainsworth, deputy managing director of the American Standards Association, by Under Secretary of Labor, James T. O'Connell. The award was made in recognition of Mr. Ainsworth's significant and outstanding contribution toward furthering the work of the Department of Labor "to foster, promote and develop the welfare of wage earners in the United States."

Since Mr. Ainsworth was unable to attend the ceremony, the Meritorious Award was accepted for him by Vice Admiral George F. Hussey, Jr., USN (ret) managing director of the ASA. This was one of three awards presented to outstanding non-governmental leaders at a meeting of the advisory committee of the President's Conference on Occupational Safety. Mr. Ainsworth has served on various safety advisory committees of the Department of Labor for more than 20 years. His efforts, along with the services of the association he represents, are credited with the initiation of some 150 voluntary safety codes, and many of the standards thus developed have been used as the basis for state regulations. He has been a member of the President's Conference on Occupational Safety since its inception in 1948, and has served on the advisory committee in planning and developing conferences.

Vincent Ahearn, general counsel of the Sand and Gravel Association and R. O. Hunt, president of Crown Zellerback Corporation, were also recipients of awards. Mr. Ahearn was director of the President's Conference on Occupational Safety from 1948 through 1959, and Mr. Hunt is the Conference director for 1960.

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Top prize winners of a $10,000 nationwide industrial safe driving contest were announced by the Hertz Corporation. More than 6,000 businessmen, representing virtually every American industry, competed in the contest, which was sponsored by Hertz Car Leasing Division.

The three-month contest was open to drivers in 152 nationwide leased car fleets of 50 or more automobiles. A winner from each fleet was selected on the basis of driving without an accident or major breakdown due to improper maintenance during the contest period.

Each of the 152 fleet winners received an individual prize and qualified for the final top prize drawings. As a further incentive to good driving performance, company supervisors of the leased car fleets also won prizes.

A Birmingham, Mich., man won the Grand Prize of an all-expense paid Hawaiian vacation. Two New York area men won the second and third prizes, which consisted, respectively, of a stereo radio-phonograph and a portable television set.

The contest, which ran from March 1, 1960, to June 1, 1960, is believed to be the first one sponsored by a national vehicle rental and leasing organization.

The contest is an extension of car leasing service to customer companies intended to supplement safety programs which these companies conduct internally.

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A President's Commendation has recently been received by Richard T. Wise, Supt.—Engr. & Maint. Services, of the B. F. Goodrich Footwear and Flooring Company, Watertown, Massachusetts from the Massachusetts Safety Council for

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excellence of their safety record for the second quarter of 1960 within the Rubber Group Classification in Massachusetts.

President Charles L. O'Reilly, in awarding the certificate for the Massachusetts Safety Council Industrial Safety Contest, stated that the Company's achievement in preventing accidents in the plant is recognized as a significant contribution to the well being of its employees and to efficient operation.

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Employees of the Pittsburg (California) oxygen plant of Linde Company, Division of Union Carbide Corporation, were awarded a Certificate of Commendation by the Safety Division of Union Carbide for having completed one year or 114,900 man hours from May 13, 1959 to May 13, 1960 without a lost-time accident, according to I. E. Barber, plant superintendent. The plant is located on California Avenue and Loveridge Road and is the largest producer of liquid oxygen, nitrogen, and argon in the West.

Commenting on the award, Barber stated that the fine safety record is the result of a concerted effort on behalf of all plant employees working safely both on and off the job. Of special note is the fact that 85 percent of the employees are new to this type of plant operation.

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Chemstrand Corporation employees at the Acrilan acrylic fiber plant at Decatur, Ala., have just passed the 4 million man-hour mark for safe work performance in continuing the longest injury-free period in the history of the plant, according to L. D. Scott, director of Acrilan Manufacturing.

"The safe-work milestone exceeds the previous continuous period without a lost time injury by more than 1,100,000 man-hours. We are proud of the teamwork and safety emphasis on the part of every employee reflected by this record, and are especially glad that our fellow employees have suffered no disabling injuries," Scott stated.

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Governor Robert B. Meyner presented New Jersey's highest safety award recently to employees of Westinghouse Electric Corporation at the television-radio plant in Metuchen.

Employees were citied for completing 6,323,659 man-hours without a disabling accident. The Governor's Safety Award, sponsored by the New Jersey State Industrial Safety Council, was received by O. H. Yoxsimer, general manager of the division. The Metuchen plant is the fourteenth of some 14,000 eligible locations in New Jersey to win the award since it was established in 1952.

In the time since being chosen for the award, the 2200 Westinghouse employees extended their safety record to more than 7,500,000 man-hours, representing a period of over two years without a disabling injury.

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Employees of two departments—accessories inspection and the tool room—at Delco Products Division of General Motors were honored recently by the Industrial Commission of Ohio for working a total of ten million man-hours without a lost time accident.

During a special safety meeting David L. Temple, Delco's director of industrial and public relations, accepted plaques from James H. Fluker, superintendent of safety and hygiene of the Industrial Commission citing each of the departments for working over five million man hours.

Praising employees for making the awards possible, Claude M. Willis, Delco's safety director, also credited supervisors for their continuing support of the Division's extensive safety program. "This citation shows the results of effective cooperation and teamwork in reducing accidents," Willis said.

He also noted that if the two departments had had the same accident experience as all industries in 1959, as reported by the National Safety Council, about 60 lost time accidents could have occurred during the course of their record period.

Both departments continue to extend their records. At the end of August accessories inspection had accumulated 5,294,627 man hours, dating from April 20, 1948. Tool room employees have registered 5,010,380 man-hours since they marked a lost time accident on October 12, 1951.

Delco Products has received the top Industrial Commission citation during seven of the past eight years, in competition with area manufacturing firms, in the Miami Valley Safety Contest, co-sponsored by the Chamber's safety council and the Industrial Commission.

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Bureau of Standards
(from page 55)

ards and gages; measurement of optical apparatus and materials, photographic materials, reference weights, volumetric, density, and fluid capacity measures; development of new types of optical and photometric apparatus for military purposes; preparing standards and specifications to promote the standardization and greater uniformity of screw threads and other products; and furnishing consulting service to other Government agencies.

The Mechanics Division has one new section, Pressure and Vacuum, of which Dr. D. P. Johnson has been named chief.

In the Heat Division, one section, Thermodynamics, has been disbanded, and four new sections have been established. The new sections and their chiefs are: Heat Measurements, Dr. D. C. Ginnings; Equation of State, Joseph Hilsenrath; Statistical Physics, Dr. M. S. Green; and Molecular Spectroscopy, Dr. D. E. Mann.

Dr. Alan D. Franklin has been named chief of the Mineral Products Division. He had been Acting Chief since November 1959, when he succeeded Dr. Irl C. Schoonover, now the Bureau's Associate Director for Planning.

Appointment of *Paul W. Saunders* as Merchandising Manager in its general offices at Rockford, Illinois, and *Harry J. Ellis* as Southwestern Regional Sales Manager with headquarters at Dallas, is announced by *MEDICAL SUPPLY COMPANY*.

Saunders, for the past eight years, has been the firm's regional sales manager of 11 southern states. Among his new duties will be supervision of advertising, sales programming, and market and product research.

Ellis comes to the company with a wide background in industrial safety. For more than seven years he was Gulf Coast division safety supervisor of Loffland Brothers Company, Inc., New Iberia, Louisiana. He is a member of the American Society of Safety Engineers, Drilling Industry Society of Safety Engineers, Louisiana Safety Association, and the Offshore Petroleum Safety Council. He is past president of D.I.S.S.E. and is now a member of its board of directors.

Thousands of persons visited the American Optical Company's safety products exhibit at the three-day Woodstock Fair. The optical firm's exhibit was in a tent sponsored by the Putnam Area Chamber of Commerce. The display showed a cross section of AO's safety products line, including safety glasses, respirators, protective clothing and safety accessories. Here, Charles C. Albrecht of Woodstock Valley, manager of engineering services for American Optical, explains how a respirator used for protection from agricultural insecticides works. His pretty listener is Carol Ann DeBerardinis of Thompson, a 4-H enthusiast and visitor to the fair. American Optical has its safety products division plant in Putnam.

Mathias M. Antz has been named southeastern United States manager for *D. W. ONAN & SONS, INC.*, Minneapolis electric-plant manufacturer. Also announced was appointment of *Edward A. Hafner* and *George H. Rentschler, Jr.*, to original equipment manufacturer sales in Minneapolis. Antz will headquarter in Atlanta.

Harlan Lea, president of *THE KONETA RUBBER CO.*, has announced the election of *Ken E. Brock*, Toledo, to the office of vice-president and as a member of the board of directors. Koneta Rubber Co. manufactures floor tile and runner matting. Mr. Brock is also president of American Mat Corporation and D. W. Moor Co., both of Toledo, Ohio.

J. Stone Carlson, of Carlson Sales Company, Needham, Massachusetts, has been named sales representative in the New England area for the complete line of industrial glove products manufactured by *THE PIONEER RUBBER COMPANY* of Willard, Ohio.

In making the announcement, Pioneer Sales Manager John R. Jones said that the appointment is part of Pioneer's overall program to facilitate and expand the distribution of the company's products and services to industry in New England and in other parts of the country.

THOMPSON RAMO WOOLRIDGE has announced the appointment of *W. G. Gordon* to the position of General Sales Manager and Assistant Division Manager in the *Dage Television Division*. James L. Lahey, Dage Division Manager, said Mr. Gordon will be responsible for the division's rapidly expanding sales program as well as the over-all coordination of Engineering, Manufacturing, and Sales.

DETECTOGAS INSTRUMENTS, INC. of Houston, Texas, has announced the appointment of *Frank A. Paul* as Sales Representative for the company's new gas safety device. He will work from the Houston office, but will also be active in the national marketing program.

INTERNATIONAL FILM BUREAU INC., producer and distributor of 16mm films, has moved to new quarters at 332 South Michigan Avenue, Chicago 4, Illinois, according to an announcement by Wesley H. Green, President. In addition

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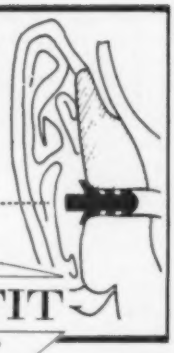

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to serving as distributor to universities, independent producers, public institutions and non-profit institutions, IFB also distributes its own educational film productions. As an aid to film libraries, IFB maintains an equipment division to supply film libraries with all necessary equipment, services, and helpful ideas.

Berton Karol, Manager of the Automotive Division of *OXY-CATALYST, INC.*, Berwyn, Pa., announces the appointment of the following as representatives for their line of exhaust purifiers for gasoline, LP Gas and Diesel Powered Industrial vehicles:

Henry F. Castle, 7601 Pembroke Road, Birmingham, Mich. (Territory: Michigan.)

Rudy Otepka Associates, 717 North Iowa Ave., Villa Park, Ill. (Territory: Illinois.)

The A. A. Betts Co., 3311 Harrison Ave., Cincinnati, Ohio (Territory: Southern Ohio and Kentucky).

F. R. Magill Co., 44 McKnight St., Pittsburgh, Pa. (Territory: Western Penna. and West Virgina).

Philip E. Chambers, 3531 Winthrop Ave., Indianapolis, Ind. (Territory: Indiana).

John J. Connell Co., Inc., 3016 Locust St., St. Louis 3, Mo. (Territory: Eastern Missouri and Southern Illinois).

Joseph H. Nook & Associates, 3537 Lee Road, Cleveland 20, Ohio (Territory: Northern Ohio).

GUARDIAN SAFETY EQUIPMENT CO., (Division Safety Inc.) announces a new office and warehouse located at 37 East 21st Street, Linden, New Jersey.

"Guardian" is franchised distributor for: Chicago Eye Shield, Scott Aviation, Johnson Williams, Fibre Metal, Medical Supply and other companies.

Serving Upstate New York, Northern New Jersey, and Metropolitan New York City, Charles M. Boyd is General Manager and Bert Polkinghorne, Office Manager.

The acquisition of exclusive manufacturing and sales rights to an automobile engine exhaust gas purifier was announced by *PANTEX MFG. CORP.* of Pawtucket, Rhode Island, in conjunction with *TEL-A-SIGN, INC.* of Chicago, Illinois.

William F. Grossman and A. A. "Bill" Steiger, the respective Presidents of the two companies, stated that production and marketing of the device will be a joint venture under a wholly owned Pantex subsidiary, the *Monoxit Pantex Corporation,* now being formed.

CLARKE FLOOR MACHINE CO. of Muskegon, Michigan, is now a division of *Studebaker-Packard Corp.*, according to an announcement by Ernest Cooper, Clarke president. The company, one of the nation's leading manufacturers of floor maintenance equipment, will operate as an autonomous division of Studebaker-Packard. There will be no change in policies, management or field personnel.

Three administrative changes in the *MICRO SWITCH* sales organization have been announced by Frank Wilsey, vice president of sales for the division of Minneapolis-Honeywell. *John K. Lincoln,* former eastern division sales manager, has been named sales manager. He succeeds Wilsey who recently was named vice president. *Richard F. Johnson* has been named central area (Cleveland) sales manager, succeeding *Kenneth J. Cumming,* who has been promoted to sales manager of Minneapolis-Honeywell's Marion Instrument division in Manchester, N. H.

John K. Bybee will represent *AMPCO METAL, INC.* as an Agent in the Southeastern United States, according to J. P. Henry, Ampco Vice President and General Sales Manager. The appointment expands Ampco's representation into Georgia, North and South Carolina, Florida and Tennessee. The new agency is located at 3469 Spring Circle, Decatur, Georgia.

Doan Ryle, a noted specialist in portable industrial x-ray equipment and nondestructive testing operations has been appointed manager of the newly formed X-Ray Division of *Labquip, Inc.* Labquip is midwestern distributor for the *BALTEAU ELECTRIC CORP.,* Stamford, Conn., manufacturers of portable industrial x-ray units. As divisional manager, Mr. Ryle will be responsible for Balteau sales and service in the Illinois, Michigan, Wisconsin and Indiana territory.

Safety Appointments

Thomas B. Woody has joined The Chemstrand Corporation at the Decatur Acrilan acrylic fiber plant in the position of Safety Supervisor, according to L. D. Scott, Director of Acrilan Manufacturing. Woody joined Chemstrand after serving as Safety Director for Murray-Ohio Manufacturing Co., Lawrenceburg, Tenn., and for Continental Carbon Co., Dallas, as a Safety Engineer. A native of Abilene, Texas, and a graduate from North Texas State College with a Bachelor of Science degree, he obtained a Master of Arts degree from New York University. He is a member of the American Society of Safety Engineers and of Veterans of Safety.

John W. Healy, an authority on radiological sciences, has been appointed consultant-technological hazards for the General Electric Company, Francis K. McCune, vice president—Engineering Services for the company, announced.

In this newly established position in Engineering Services, located at company headquarters in New York, Mr. Healey will be available to all General Electric components for consultation regarding technological hazards. He was formerly located at the company's Hanford Atomic Products Operation, Richland, Wash.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, Etc., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912, OF SAFETY MAINTENANCE, published monthly at Rensselaer, N. Y., for October 1, 1960.

State of New York, County of New York, ss. Before me, a Notary Public in and for the State and County aforesaid, personally appeared Arthur Snyder, who, having been duly sworn according to law, deposes and says that he is the business manager of SAFETY MAINTENANCE, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management and circulation of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in Section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editors and business manager, respectively, are: Publisher, Alfred M. Best Company, Inc., Executive Offices, 75 Fulton Street, New York, N. Y.; Managing Editor, C. M. Kellogg; Editor, Harry Armand; Business Manager, Arthur Snyder; all of 75 Fulton Street, New York, N. Y.

2. The owner is Alfred M. Best Company, Inc., 75 Fulton Street, New York, N. Y.; and the owners of 1% or more of the stock are: Gertrude V. Ammermuller, 235 West 102nd Street, New York, N. Y.; Mildred B. Baird, 28 Prospect Ave., Montclair, N. J.; Voting Trustees under the Will of Alfred M. Best, 75 Fulton St., New York, N. Y.; Randolph C. Betts, Montreal, Canada; Clem & Company, Boston, Mass.; Lillian E. Floegel, 111 Stratford Ave., Garden City, N. Y.; Andrew J. Gavey, 5 Orchard St., Glen Lyon, Pa.; Kellogg & Company, % Nat'l State Bank, Summit, N. J.; Alice L. Kellogg, 615 Tremont Avenue, Westfield, N. J.; Chester M. Kellogg, 615 Tremont Avenue, Westfield, N. J.; Wilhelmina J. Kellogg, 603 Tremont Ave., Westfield, N. J.; Frank J. Matre, 10 South LaSalle St., Chicago, Ill.; John R. McElravy, 394 Porter St., Manchaster, Conn.; Raymond T. Smith, 10 South LaSalle St., Chicago, Ill.; Vance C. Smith, 20 North Wacker Drive, Chicago, Ill.; Arthur Snyder, 75 Fulton St., New York, N. Y.; Kathryn Snyder, Garden City, N. Y.; Elma W. Thomas and Joan W. Thomas, Indianapolis, Ind.; William E. Whitney, 105 Juniper Rd., Belmont, Mass.

3. That the known bondholders, mortgagees and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages or other securities are: None.

4. That the two paragraphs next above giving the names of the owners, stockholders and securities holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company, but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees hold stock and securities in a capacity other than that of a bona fide ownership; and this affiant has no reason to believe that any other person, association or corporation has any interest, direct or indirect in the said stock, bonds or other securities than as so stated by him.

5. The average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the 12 months preceding the date shown above was: 13,461.

ARTHUR SNYDER,
Business Manager.

Sworn to and subscribed before me this 28th day of September, 1960.

DONALD F. AYERS
NOTARY PUBLIC, State of New York
No. 30-5133375
Qualified in Nassau County
Commission Expires March 30, 1962

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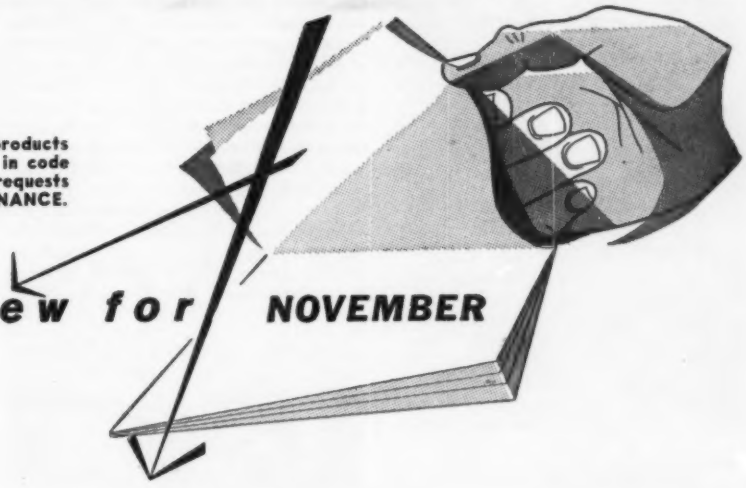
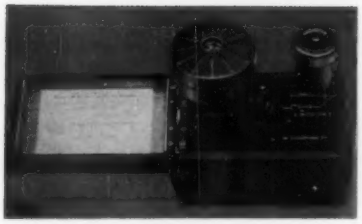


what's new for NOVEMBER



BREATHING RESISTANCE TESTER— GAS MASK CANISTERS

(Use Key # 892 on Inquiry Card on page 1)

THIS EQUIPMENT, developed by the Draeger Oxygen Apparatus Corp. and distributed by New Jersey Safety Equipment Co., is designed to test all kinds of breathing canisters which offer protection against fine dusts or against gases and fine dust. Measurement depends on comparison of the breathing resistance of the canister with an adjustable control resistance at an air-flow of 30 litres per minute. The control resistance consists of a perforated tube closed at the top which can be pushed up or down within a tube casing. According to the tube's position, a larger or lesser number of holes are exposed whereby flow-resistance rises or falls. A scale indicates comparative resistance.

ICE THAWING PELLETS

(Use Key # 893 on Inquiry Card on page 1)

A NON-CORROSIVE compound of heat generating chemicals in pellet form has been announced by Consolidated Paint & Varnish Corp. for use in frozen drains, downspouts, etc. A few pellets of Ice-Chaser placed in ice-packed drains and gutters are said to thaw them out up to 30 times faster than rock salt. Used to free ice-clogged sewers, the product prevents water back-up. It can also be used in loading zones, driveways, walks and entrances to keep them clear of ice and snow, preventing slips and falls. It leaves no residue and will not injure surfaces.

WATER-REPELLENT SEALER

(Use Key # 894 on Inquiry Card on page 1)

A NEW SEALER, developed by Worrell-Consolidated Laboratories, Inc., may be applied to various building materials, including limestone, brick or stucco, and will keep out all moisture, the company reports. The product, Syn-Rez is said to be effective over a long period of time. It is easy to apply, requires only one coat, and is clear in color, so that it can be applied over any paint, or be painted over.

DRY CHEMICAL FIRE EXTINGUISHER

(Use Key # 895 on Inquiry Card on page 1)

A 2¾ lb. PRESSURIZED type dry chemical extinguisher which received a 6 unit rating from Underwriters' Laboratories is being manufactured by M. L. Snyder & Son, Inc. The new unit, which is designed to combat Class B (flammable liquids) and Class C (electrical) fires, also has Factory Mutual and U. S. Coast Guard approval. Extinguishing power of the Stempel 503 is reported to be 50% greater than that of the 2½ lb. unit. Valve assembly, operating lever and carrying handle are of corrosion-resistant brass or stainless steel. Marine and industrial bracket included.

SAFETY SPECTACLE LINE

(Use Key # 896 on Inquiry Card on page 1)

A NEW LINE of six basic models of safety glasses, called Durasafe, has been introduced by American Optical Co. Available in a range of sizes and colors, and accenting a new wider temple of anodized aluminum, the glasses feature a seven barrel hinge, said to make frame-temple juncture 40% stronger. Duragrip screw construction keeps temples permanently tight; screws cannot fall out.

Also featured are wider endpieces which give more strength because of greater temple surface; Lock-A-Lens, a new safety ridge which tends to hold the lens in place under impact; and non-reflecting mesh side shields for comfort and safety.

FOOD PROCESSOR'S GLOVE

(Use Key # 897 on Inquiry Card on page 1)

AN EXTRA-LARGE glove size for men in the food processing industry has been added to the line of Stanzoil N-30 Whitecaps made by The Pioneer Rubber Co. The new gloves, made of milled DuPont neoprene, will withstand oils, greases, acids, caustics and solvents that ruin ordinary rubber gloves. The red neoprene lining is designed with a satinized finish for ease in handling. Hand fatigue is eliminated with an exclusive non-slip finish. Curved fingers and tapered palms fit the contours of the hand without restricting dexterity.

IMPROVED SMOKER STANDS

(Use Key # 898 on Inquiry Card on page 1)

ALL CRINKLE finished models in the Sipco Dunking Station Line manufactured by Standard Industrial Products Co. now have a smooth satin finish on the canister lids. In addition to presenting a more pleasing duo-tone appearance, the smooth surface is easier to clean, since cigarette ashes cannot become imbedded.

FLUORESCENT FABRIC

(Use Key # 899 on Inquiry Card on page 1)

COATED FLUORESCENT fabrics in various colors, utilizing specially pigmented vinyl on either a nylon or glass cloth base, are produced by Cordo Chemical Corp. One basic fabric is said to have a high degree of observability, due to light rays passing through the top layers of the pigment, striking a special undercoat and being returned in a considerably intensified form (violet and blue light wavelengths converted to orange, red and yellow wavelength colors). It is reported these fabrics are best seen at dawn or in overcast weather. Designed to resist wind-whipping, they are intended for use in life rafts, vests and jackets, safety flags, etc.

VERSATILE PORTABLE DRILL

(Use Key # 900 on Inquiry Card on page 1)

A COMPACT, multi-purpose, rotary unit designed for subsurface exploration and production drilling in soils, rocks and concrete has been announced by Mobile Drilling, Inc. Engineered from lightweight, high-tensile alloys, the Minuteman is believed to be the only truly portable drill that features big rig rotary drive for greater drilling capacity and versatility. It handles continuous flight augers from 3" to 12" in diameter and drives 6" diameter augers to 30' depths. When equipped for core drilling, it drives "EW" core barrels to 200'; equipped for masonry drilling, it cuts 1' to 8" diameter cores from steel reinforced concrete in standard lengths required for quality control testing. As a production boring rig it permits fast, economical erection of fences, guard rails, parking meters, etc.

Weighing 150 pounds, the unit features a 6 HP engine, 8 speed automotive transmission, diaphragm-type carburetor for drilling at any angle, 44" stroke with power or hand feed both in and out of the hole, wheel mounted base for easier handling and two point anchoring for maximum stabilization in soils, rocks or concrete. Although designed for one man portability, the Minuteman may be adapted for truck or trailer mounting as well.

WEAR RESISTANT TILE

(Use Key # 901 on Inquiry Card on page 1)

A NEW FLOOR tile for commercial and institutional use, said to afford unequalled resistance to wear, scoring, denting and puncturing, has been announced by American Mat Corp. Made of the recently developed compound, Nyracord, this tile is said to withstand heaviest foot traffic and even destruction by spikes, cleats and skates. Resilient, it silences footsteps, is exceptionally slip resistant, wet or dry, and is easy to keep clean. Mardi Gras tile is available in a choice of thicknesses, sizes and colors.

PRESSURE TRANSDUCERS

(Use Key # 902 on Inquiry Card on page 1)

DEVELOPMENT OF miniature, high pressure, high temperature pressure transducers, capable of measuring up to 15,000 psi, and weighing less than 0.25 lbs., has been announced by Colvin Laboratories, Inc. The units are only one inch in diameter. Designated Series 8416, the transducers are designed to measure pressures in any range from 0 to 400 psi to 0 to 15,000 psi and are available in various resistance values.

The pressure sensing element is a twisted tube which moves a wiper across the winding of a precision potentiometer in response to changes in pressure. The pressure and potentiometer elements are enclosed in a sealed case which is provided with suitable pressure ports and electrical terminals. The transducers can be manufactured to measure gage, absolute or differential pressures. For special applications, they can be made to withstand temperatures up to 600°F, vibration as high as 35 g's and operation in corrosive atmospheres such as inhibited red fuming nitric acid or other materials.

LAB GLASSWARE WASHER

(Use Key # 903 on Inquiry Card on page 1)

A MEDIUM CAPACITY glassware washer designed for smaller laboratories is being offered by Fisher Scientific Co. The Standard Washer is available in both a steam-heated and an electrically-heated model. The entire washing program of steam, water and drainage is electrically controlled by a selector switch. A rotating drum carries baskets of glassware repeatedly in and out of the hot water solution. A safety switch shuts off power and closes valves when unit's lid is raised, assuring that personnel will not be splashed with hot water. Heating element is protected from accidental burn-out by water-level regulator.

RUST RESISTANT PAINT

(Use Key # 904 on Inquiry Card on page 1)

PROTECTION OF metal from rust and weather damage is offered by Speco, Inc. in the form of Rustrem, a new paint said to be suitable for machinery, buildings, tanks, etc. The product requires no primer and can be sprayed or brushed on without most of the wire-brushing, scraping and sandblasting frequently required. It is reputed to penetrate rust layers and adhere firmly to the base, forming a tight seal to resist moisture, temperature changes, chemicals and mild acids. Can be applied in locations where moisture is always present, or in emergency winter painting.

PLASTIC WELDING GOGGLES

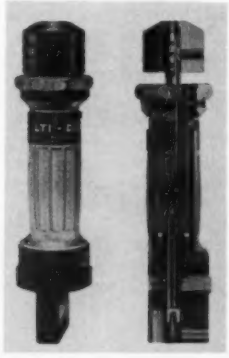
(Use Key # 905 on Inquiry Card on page 1)

SOFT VINYL plastic goggles which feature a protective vinyl noseguard and unbreakable nylon insert have been announced by Glendale Optical Co. The goggles mold comfortably to face contours and fit with ease over prescription glasses. Other features include six light-proof indirect ventilators to eliminate harmful light rays and fogging, removable rings and Glenweld filter lenses.

SLIP AND ANTI-STICK SPRAY

(Use Key # 906 on Inquiry Card on page 1)

AN EASY-TO-APPLY reinforced fluorocarbon slip and anti-stick agent in 6 oz. aerosol spray cans has been introduced by Dixon Corp. Rulon spray provides a low-friction, dryfilm which is chemically inert, insoluble, and thermally stable to over 500°F.; for use on wood, metal, leather, plastics, etc. It is non-gummy and will not collect dust. Coefficients of friction as low as .07 are reported. "Stick-slip" at low speeds is also eliminated. Product serves as a lubricant for belts, gaskets, packings, bearings, cord, machine parts, etc.; and as an anti-stick agent for blenders, tanks, chutes, conveyors, etc.



POWER FASTENING TOOL

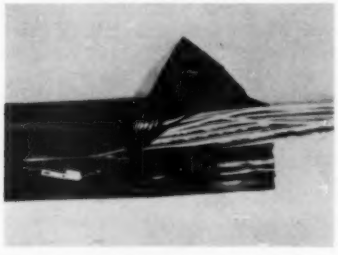
(Use Key # 907 on Inquiry Card on page 1)

A NEW TOOL for fastening into dense materials such as concrete, concrete or cinderblock and structural steel, has been developed by Hilti, Inc. The DX 100-L provides safety features said to eliminate the hazards of richochet, fishhooking and explosive spall. Instead of starting the fastener away from the material and accelerating it to high speed before impact—a factor cited as a cause of accidents—the Hilti tool starts the fastener in contact with the material and then pushes it in. This is accomplished by using a heavy hammer to hit the high mass steel piston, which contains a very light, slow burning blank charge. There is no initial velocity and relatively slow acceleration.

WIRE & CABLE ENCLOSURE

(Use Key # 908 on Inquiry Card on page 1)

DESIGNED TO AID maintenance men in the insulation and enclosure of wires in buildings, Zippduct provides both hanger and jacket for raceways in a single operation. It can be stapled to studs, eliminating need for taping, brackets, clamps or hangers. The product, manufactured by Zippertubing Co., is simply wrapped around wires, then zipped close. Zipper closure permits system to be re-checked whenever necessary. If desired, jacket can be sealed with ZT Sealer so that it becomes waterproof, rodent repellent and flame-resistant. Temperature range of the U.L. authorized product is from –40° F. to 211° F.

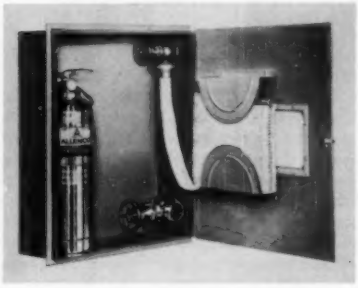


METAL PROTECTIVE PAINT

(Use Key # 909 on Inquiry Card on page 1)

AN ALL-PURPOSE black coating, for protecting metal against rust and other exposure conditions, is announced by Maintenance Inc. Trade-named Everwear J-41-B, the paint is reputed to produce an attractive, bright ebony black finish, impervious to water and resistant to chemical attack by gas fumes and smoke. Because of its penetrating and spreading qualities, it can be used after minimum surface preparation. It is said to be anti-corrosive above or below grade.

According to the manufacturer, J-41-B remains elastic, permitting it to expand and contract with metal during extreme temperature changes. This makes it highly suited to tanks, metal roofs, siding, drains, bridges, beams, girders, cables, steel window frames, machinery, etc. The product dries quickly and is adaptable to either brush or spray application.



TRIMLESS FIRE CABINETS CUT SPACE REQUIREMENTS

(Use Key # 910 on Inquiry Card on page 1)

REQUIRING 35% less area than other cabinets, trimless Hozegard fire cabinets, available from W. D. Allen Mfg. Co., install on any plane—even in the floor. Flush mounting and elimination of trim reduce the exposed portion to the size of the door. The visible part of one cabinet, for example, is 200 sq. in. less than comparable models with trim, but with less equipment.

The new units feature knockouts for installation of 2½ inch pressure restricting angle valves and include 180°-swing, foul-proof hose racks mounted on the door instead of inside the cabinet. These racks accommodate from 25 to 100 feet of regular linen or cotton rubber lined fire hose, depending upon the cabinet model chosen. An exclusive hose clip makes the Allenco cabinet semi-automatic, for one-man operation. When equipped with this clip, the entire unit is 100% UL listed.

Available in steel, aluminum, stainless or bronze, and supplied with continuous hinges and chrome-plated handles. Optionals include flush steel doors, rosette ventilation openings, break glass latch shield and chrome-plated valve(s), couplings, fittings, nozzle and extinguishers.

FOAM PRODUCING SYSTEM

(Use Key # 911 on Inquiry Card on page 1)

A MACHINE capable of generating 12,000 cubic feet of foam per minute and driving it 2,000 feet from the mouth of the unit, is being manufactured by Safety Development Corp., primarily for use in fighting mine fires. The Hi-Ex may also be adapted to provide fire protection in warehouses and industrial plants, and for the formation of a foam cover in vineyards and vegetable farms to prevent frost damage.

Principle of the giant bubble gun, said to be the world's largest, is the rapid generation of high expansion foam having 1,000 times the volume of the liquid in contrast to the conventional 10-to-1 expansion ratio. This bubbling mass fills every air space and starves the flames for oxygen. Conversion of the bubbles to water and then to steam absorbs much of the fire's heat, creating a cooling action, preventing recombustion, and eliminating the hazard of gaseous explosions. Examined by the U. S. Bureau of Mines.

NON-SLIP SURFACING MATERIAL

(Use Key # 912 on Inquiry Card on page 1)

ELIMINATION OF slips and falls and substitution of sure footing on hazardous metal floor and stair surfaces was achieved by the Portsmouth, N. H. Fire Dept. through use of Dura-Grip, an abrasive surfacing material, reports Mine Safety Appliances Co., distributor of the product. It was also found to be effective on pumper running boards and on brake, clutch, and gas pedals. The preparation, in kit form, consists of a zinc chromate base, bonding compound and abrasive particles; said to be fast-drying.

MOTION DETECTOR

(Use Key # 913 on Inquiry Card on page 1)

DESIGNED TO "sense" increments of rotary motion as little as or less than ½ RPM, a devise developed by Gaylord Products, Inc., can also be used to detect linear motion by a simple conversion to rotary motion. Unit also detects complete "zero motion." The mechanism, which is being offered to industry for a wide number of applications in automated and semi-automated operations, was originally designed to prevent automobiles with automatic transmissions from "creeping" while idling in gear.

As an automobile anti-creep device, it actuates a switch which triggers a solenoid on the brake line system to hold predetermined pressure. Applying normal pressure to the accelerator pedal causes a second switch to release the solenoid. The device is said to have virtually frictionless operation; it will operate from —40°F. to +240°F.; not affected by magnetic fields. Only 2½ inches high, it can also be utilized where miniaturization is required.

PORTABLE VENTILATORS

(Use Key # 914 on Inquiry Card on page 1)

A LINE OF ventilators for exhausting fumes or circulating air in areas where permanent installations are impractical has been introduced by the Propellair Division of Robbins & Myers, Inc. Designated as Type PT ventilators, the units combine a portable fan with lengths of flexible duct for supplying emergency air to personnel working in cramped or unventilated spaces, venting dangerous fumes, or for cooling overheated equipment.

Construction features include safety guards and carrying handles, heavy gage steel housings with reinforced flanges for extra rigidity, and wire reinforced flexible duct that mounts easily on fan flanges or snaps onto other duct sections. Propellers are cast of aluminum magnesium non-sparking alloy and have airfoil section blades that overcome the pressure drops in the flexible hose. Explosion proof motors available.

NEW VIBRATION METER

(Use Key # 915 on Inquiry Card on page 1)

A BATTERY-OPERATED, hand-carried vibration meter with high gain, transistor circuitry is being marketed by the Korfund Co. Type PR-9252, a self-contained instrument reading peak amplitudes of both absolute and relative vibrations directly on its large meter dial, can be used wherever vibrations must be measured or monitored. Readings are in microns, over its 5 cps to 1200 cps frequency range. It has a measuring range from 0 to 1000 microns value (0.039") in 5 steps, and a sensitivity down to 0 to 10 microns full scale (0.00039").

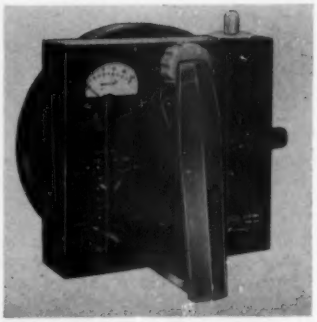
Internal calibration is available in every range.

The meter aids machinery maintenance: Comparing the vibration amplitude at installation with later readings, taken at regular intervals, establishes the amount of wear in bearings or cutting tools, and indicates when replacement will be necessary before breakdown. Oscilloscope connection permits permanent record making or phase measurements of rotating objects.

NEW SAFETY SPECTACLES

(Use Key # 916 on Inquiry Card on page 1)

SAFETY GLASSES in two eye sizes, with an easy-fit nose bridge said to accommodate the great majority of users, are available from Pulmosan Safety Equipment Corp. Frames and temples incorporate smart styling; low nose bridge eliminates cumbersome nose pads. Supplied with or without side shields.

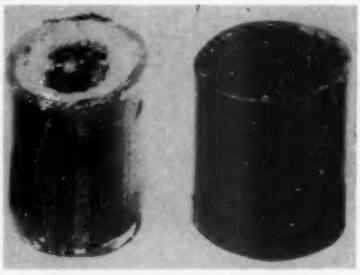


NEW RADIATION METER

(Use Key # 917 on Inquiry Card on page 1)

A LIGHTWEIGHT self-contained instrument for making accurate power density measurements of radar and transmitting equipment—the Model B86L1 Sperry Electro-Magnetic Radiation Meter, developed by Sperry-Rand, is being distributed by the Filtron Co. Applications include: the determination of power densities for the protection of service personnel and equipment; detection of leakage in shielded areas, waveguides and equipment enclosures; measurement of field intensity patterns of radar and similar types of antennas.

In operation, a technician can read power density directly on one of four scales, from 0 to 20 mw/cm^2 over a frequency range from 400 to 3000 megacycles. An antenna and bolometer bridge are used only on the 0-20 mw range, while a second antenna, crystal detector and amplifier assembly are used on the three more sensitive ranges (0—.02 mw/cm^2, 0—.2 mw/cm^2, 0—2 mw/cm^2). Designed for simplicity of operation, an adjustable control provides a red visual alarm light when the power density of any desired level is reached.



LIQUID SCALE REMOVER

(Use Key # 918 on Inquiry Card on page 1)

SCALE, SLIME and algae removal and rapid head pressure reduction on air conditioning systems, without danger of acid burns or metal corrosion, can be accomplished with Scalex, reports the manufacturer, Lester Laboratories, Inc.

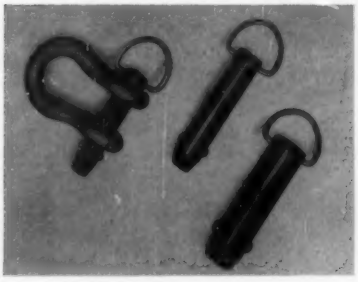
Scalex is non-toxic and gentle to the hands and eyes; it contains no hydrochloric or other fuming acids; does not corrode copper, brass, aluminum or steel; and will not attack wooden or painted towers. Photograph shows cut section of a copper pipe before and after (right) scale remover treatment.

PRESSURE CONTROL FOR SPRINKLER SYSTEMS

(Use Key # 919 on Inquiry Card on page 1)

THE TYPE J7X-5355 Pressure Control is one of the latest units to be added to the United Electric Control Co.'s line of pressure controls. This compact, low-cost unit is specifically designed to control electric motor and alarm circuits in sprinkler systems. It is FM approved and UL listed, and may be used with alarm check valves, dry-pipe valves and special water control valves to actuate an electric alarm when the valves operate.

Pressure settings are easily made by an internal adjustment nut. The adjustable range is 0 to 20 PSI with a range stop provided to prevent adjustments above 20 PSI. Proof pressure is 300 PSI and maximum pressure, 500 PSI. Switch actions are normally open, normally closed or double throw. Switches are single pole and suitable for ambient temperatures up to 180°F. Standard electrical rating is 15 amps, 120/240 Volts, AC. Other approved ratings are available.



MULTI-PURPOSE PINS

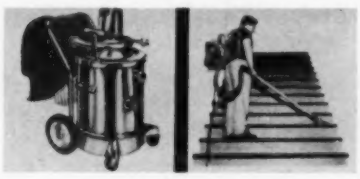
(Use Key # 920 on Inquiry Card on page 1)

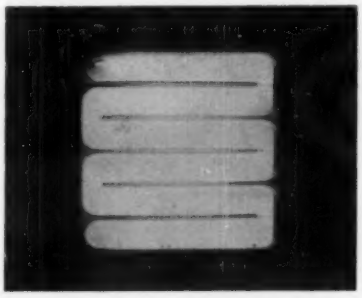
QUICK-RELEASE pins which eliminate the need for cotter pins, locknuts, etc., without increased costs, are being manufactured by Waldick Engineering Co. The new Eco-Pins are designed with extra-large stainless steel lock buttons; activated by siliconized rubber, which will hold against vibration even in oversized holes. Alignment is made easier by a solid tapered end. Available in sizes from ¼" and up in stainless steel, naval bronze, or plated steel. They can be used as clevis pins, as chain and anchor shackle pins, safety-lock pins or shear-load pins, or wherever a quick-connect and disconnect pin is required.

WET-DRY VACUUM CLEANER

(Use Key # 921 on Inquiry Card on page 1)

A HEAVY-DUTY wet-dry vacuum cleaner featuring a demountable motor that converts into a compact blower unit, a portable vacuum cleaner which straps on an operator's back and a large capacity vacuum cleaner for use with a standard 55-gallon drum, has been introduced by Clarke Floor Machine Co. The new cleaning unit is available with a choice of three interchangeable motor units that develop ¾, 1 and 1½ horsepower. It also has an external filter and a 15-gallon heavy gauge stainless steel tank, which mounts on either of the two carriage bases available—a wheel base with 10" diameter, rubber tired rear wheels, two casters and handle or a caster base with four swivel casters. Unit is said to be capable of meeting virtually every cleaning requirement.





AREA LIGHT SOURCE

(Use Key # 922 on Inquiry Card on page 1)

A FLAT, RECTANGULAR lamp comprised of large, thin glass plates no more than an inch and a half thick, is said to represent an entirely new concept in fluorescent lighting. Developed by Westinghouse Lamp Div., the unusual lamps consist of a labyrinth sealed in a thin glass block. The arc or electric discharge travels this winding path through the glass block to produce, in effect, a large area source of light.

Designed for use in modular fashion, the foot-square models will be 40 to 50-watt lamps, and will produce considerably more light than a 100-watt incandescent bulb.

TWO-FINGER POLY GLOVE

(Use Key # 923 on Inquiry Card on page 1)

A LOW COST polyethylene glove combines the advantages of a mitt with the dexterity of a glove, and it can be disposed of after a few times or re-used. The reversible feature lengthens the life of the glove. A product of Singer Glove Mfg. Co., the glove protects against acids, caustics and injurious chemicals. It is lintless, watertight, moisture-proof and non-toxic. Also available in the 5-finger type.

ANCHOR BOLT CEMENT

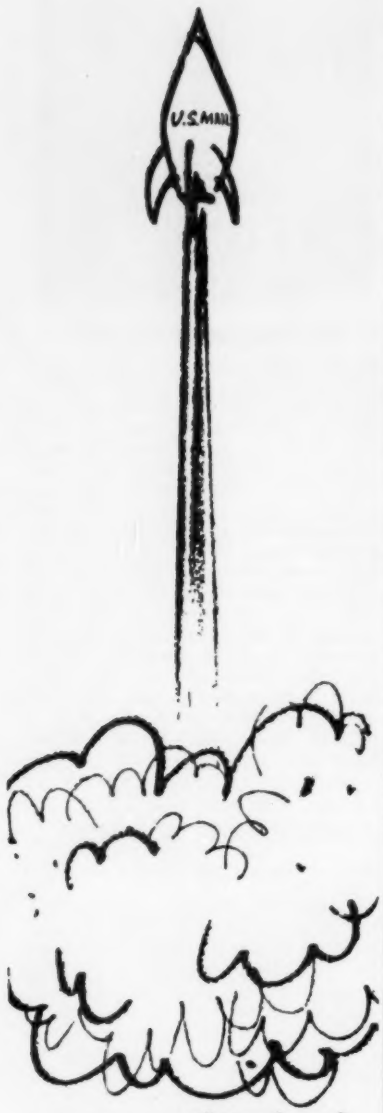
(Use Key # 924 on Inquiry Card on page 1)

AN IMPROVED pourable cement, reputed to greatly reduce time required for securely setting anchor bolts, has been announced by National Asphalt Corp. Nacor Anchor Bolt Cement is furnished in powder form. Mixed with water, it becomes semi-fluid, easy to pour or trowel. Applied around a bolt, it bonds itself firmly to both bolt and hole surfaces. It is claimed to set in 10 minutes with virtually no shrinkage. The manufacturer states that anchor bolts can be drawn tight and ordinary stationary equipment put in operation within 30 minutes. A 60-minute waiting period is recommended for extra heavy vibrating machinery. The material is oil resistant. Also useful for fastening of partitions, pipe flanges, hand rails, etc.

HEAVY-DUTY SQUEEGEE

(Use Key # 925 on Inquiry Card on page 1)

A HEAVY-DUTY rubber floor squeegee for use in plants, refineries, garages, etc., has been announced by the Reuter Mfg. Co. Developed for efficient removal of water, oil, grease, grime and debris from floors and other surfaces, the new squeegee is molded of specially treated, resilient rubber that attaches to an anodized aluminum handle with plated spring steel brackets. The unit is reputed to resist rust, corrosion, or other harmful effects of oil, sludge or industrial solvents, and is non-sparking and non-conductive. The rubber blade has high rebound elasticity that prevents deformation. Available in 18", 24" and 30" blade widths.



zone mail indeed results in speed

The Post Office has divided 106 cities into postal delivery zones to speed mail delivery. Be sure to include zone number when writing to these cities; be sure to include *your* zone number in *your* return address — after the city, before the state.

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Sigma Engineering Co.	59	Parker Advertising, Los Angeles
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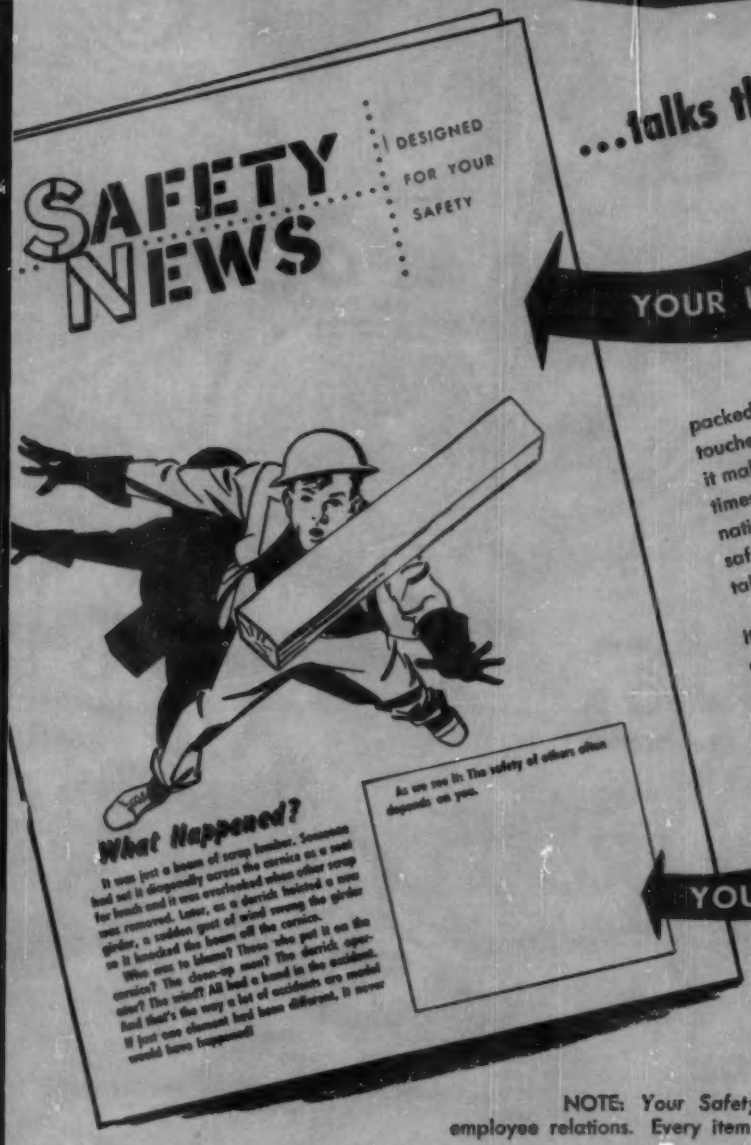
SEND THIS PERSONAL SAFETY MESSAGE TO EVERY ONE OF YOUR EMPLOYEES.

- Safety is made appealling . . . vivid . . . engaging . . . colorful!
- Each worker clearly sees how safety benefits him . . . how doing his part helps others!
- You get enthusiastic safety cooperation instead of tolerance . . . from every employee . . . every month!



. . . talks the worker's language!

YOUR IMPRINT HERE!

packed with pictures, alive with animated cartoons, touched with humour that gives snap to your message, it makes safety interesting and down to earth. Twelve times a year it covers accident hazards. Across the nation leading industrial firms state it's the only safety paper their employees will read . . . and take home to their families.

It gives the employer the advantages of personal contact . . . saves time and expense. One "lost time" accident prevented . . . more than pays for the yearly cost! Try it . . . it works!

YOUR SIGNATURE HERE!

Make Your Safety News your own publication . . . your good will ambassador . . . working for you toward better industrial relations. If you wish, your facsimile signature can be printed here to identify you with the message that gets next to your men and boosts morale.

NOTE: *Your Safety News* is designed to promote better employer-employee relations. Every item is carefully weighed and tailored to this viewpoint!

INSIDE PAGES
(Pages 2 and 3)

THOUGHTLESSNESS IS A THIEF
He'll steal his way into what you're doing, distract your attention and walk off with a finger, arm, eye or foot. Thoughtlessness takes many forms: it may be daydreaming, or worry about some personal problem, or just plain inattention. Anything that distracts you, especially around machinery, is a thief of your personal safety.
PLAYFULNESS IS A PIRATE
He is a deceptive rascal. His hi-jinks may put him in the spotlight, but his practical jokes and showing-off often result in serious bodily injury and even death. And note this: he, himself, has lost a leg! As so often happens, horseplay can boomerang and the practical joker gets hurt too!
What You Should Know About Carbon Monoxide
This is a picture of carbon monoxide gas!
That's right, you can't see it. It's odorless, non-irritating, tasteless, practically odorless, but also deadly.
Here are the symptoms of carbon monoxide poisoning: First, a tight feeling across the forehead, followed by headache, throbbing temples, weariness, weakness, dizziness, nausea, loss of muscular control, increased pulse and breathing. BUT, if the concentration of the poison gas is high, there may be loss of consciousness without these warning signals.
Just a few breaths of air containing 1% carbon monoxide can be fatal . . . as can one part of carbon monoxide in a thousand parts of air when breathed for 90 minutes.
It is possible for carbon monoxide to leak inside of a car if there is a loose exhaust pipe or manifold connection, blown-out exhaust gasket, cracked exhaust manifold, or leaky muffler. Play it safe.
1. Be sure your muffler and exhaust are in good condition (they can leak long before they become noisy).
2. Always keep a car window open, even a little, for fresh air.
AN INTIMATE LOOK AT FOUR VILLAINS
SAFETY LAZINESS IS A SIMON LEGREE
If you are lazy about safety rules, then accidents will have the whip hand. We are safety-lazy when we don't bother to use mechanical guards, to take time to get the right tools for the job, to wear protective equipment such as goggles, hard hats, safety shoes, respirators, gloves, etc. Yes, Simon Legree has a whole pack of accident hounds to track you.
HAZARDOUS METHODS ARE A HOLD-UP MAN
This villain, unsafe work habits, likes to lie in ambush for the unwary. But how do we fall into bad working habits? It may be by trying to cut corners, by wanting to keep to the old way of doing things, or by over-confidence. It's hard for anyone to believe that an accident can happen to him. It's easier to make excuses to ourselves for ignoring safety rules, but alibis only lead us up a blind alley with an accident waiting in ambush.
Two Excellent Reasons
For Wearing Safety Shoes

EMPHASIZES SELF INTEREST

Your employee's self interest in his own safety is always emphasized. Constant safety consciousness is promoted by covering household hazards, transit to and from the job and on the job caution against accidents.

CLEVERLY ILLUSTRATES THE POINT

Artwork is carefully chosen to lodge home each point persuasively. The cartoon style makes YOUR SAFETY NEWS as familiar and welcome as the picture packed Sunday supplement.

WINS READERS WITH A FOLKSY APPROACH

Keeping the contents folksy, adding the light note of humor, gets your message across with a nudge instead of a bludgeon. Your monthly chat gets enthusiasm instead of indifference.

RIVETS ATTENTION WITH VIVID COLOR

Generous use of color sparks the message, and adds impact to the contents of YOUR SAFETY NEWS. Each issue is as alive as any news-stand favorite.

HOW TO ORDER:

YOUR SAFETY NEWS may be ordered with either the standard imprint or with your Own Special Imprint. The standard imprint reads "PLEASE COOPERATE FOR THE SAFETY AND HEALTH OF ALL . . . signed . . . A SAFE WORKER."

You can personalize YOUR SAFETY NEWS with the name of your firm and the name or facsimile signature of a company representative as illustrated. Give full instructions for your Special Imprint on the order blank below:

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NOTE: Although a personal signature is effective, some firms substitute: SAFETY DEPARTMENT, YOUR SAFETY COMMITTEE, A SAFE WORKER, etc.

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If your company has not installed the Payroll Savings Plan thus far, you, too, may be surprised to find how great a number of your people will welcome this convenient way to start saving. The Plan is simplicity itself to put in. Just contact your State Savings Bonds Director and have him show you just how the Plan works. Let him help you set up a thorough canvass of your company family, so that every employee may be invited to share in this easy way to become a shareholder in America. Experience in other fine companies shows that such an invitation usually results in an enthusiastic response.

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